...30 1917
...OF MICH.
...RARY

British Medical Journal

The Journal of the British Medical Association

INCLUDING AN EPITOME OF CURRENT MEDICAL LITERATURE.

WITH SUPPLEMENT.

No. 2948. SATURDAY, JUNE 30, 1917. Price 8d.

CONTENTS Page 1. INDEX TO ADVERTISEMENTS Page 2.

NEW EDITION. In Two Vols. 42/- net.

DEFORMITIES

EXCLUDING

DISEASES OF THE BONES AND JOINTS.

A TEXT-BOOK OF ORTHOPÆDIC SURGERY.

By A. H. TUBBY, M.S.Lond., F.R.C.S.Eng.

Illustrated by 10 Plates and over 1,000 Figures, and by Notes of Cases.

1st EDITION.—"The standard text-book in English on the subject."—*The Lancet.*

2nd EDITION.—"Standard work on the subject in the English language."—*Brit. Med. Jour.*

MACMILLAN & Co., LTD.,
St. Martin's Street, London, W.C.

Now Ready. Pp. xi + 209. With 3 Charts. 5s. net.

ON ALCOHOLISM:

Its Clinical Aspects and Treatment.

By FRANCIS HARE, M.D.,
Medical Superintendent of the
NORWOOD SANATORIUM,
Beckenham.

"Marked by candour, common sense, and modern ideas . . . likely to become the standard text-book."—*British Medical Journal.*

London: J. & A. CHURCHILL,
7, Great Marlborough Street, W. 1.

FOURTH EDITION. JUST PUBLISHED.
Pp. 260, with 40 Illustrations, cloth, 6s. net.

SQUINT:

Its Causes, Pathology and Treatment.

By CLAUD WORTH, F.R.C.S.,
Surgeon Royal London Ophthalmic Hospital (Moorfields), etc.

H. K. LEWIS & DANIELSSON, 83, Gt. Titchfield St., W.

By C. MANSELL MOULLIN,
M.A. Oxon., F.R.C.S., Consulting Surgeon to the London Hospital.

ENLARGEMENT OF THE PROSTATE.

Fourth Edition. Price 6s.

THE BIOLOGY OF TUMOURS,

including the Bradshaw Lectures.

New and Revised Edition. Price 2s. 6d. net.

London: H. K. Lewis & Co., Ltd., 136, Gower St., W.C. 1

REGISTERED AS A NEWSPAPER.]

USED IN THE U.S.A. ARMY.
TWO BOOKS FOR THE WAR.

WITH PREFACES BY SURG.-GEN.

SIR A. KEOGH, G.C.B.

SURGERY IN WAR.
By Lt.-Col. A. J. HULL, F.R.C.S.
Illustrated. 10s. 6d. net.

"There was a definite need for a summary of the present-day practice, and this work has supplied the need excellently."—THE LANCET.

SANITATION IN WAR.
By Major P. S. LELEAN, C.B., F.R.C.S.
2nd Edition. Illustrated. 6s. net.
Just Out.

The New Edition of Lelean's famous book contains much new matter and many new illustrations. It has been written at the Front, and the chapter on Field Conservancy describes the very latest methods. There is a new chapter on "THE ROLE OF INSECTS IN WAR," written with the assistance of Major E. E. Austen.

London:
J. & A. CHURCHILL, 7, Great Marlborough St., W. 1.

Second Edition, revised and enlarged. Now Ready.
Crown 8vo. 6s. net.

TREATMENT OF

DISEASES OF THE SKIN.

By KNOWSLEY SIBLEY, M.D.Camb.

London: EDWARD ARNOLD, 41 & 43, Maddox St., W.

By O. LEYTON, M.D., D.Sc., F.R.C.P.
Physician to the London Hospital.

THE MODERN (ALLEN) TREATMENT OF DIABETES MELLITUS.

NOW READY. Price 3s. net.

ADLARD & SON & WEST NEWMAN, LTD.,
Bartholomew Close, London, E.C.

SECOND EDITION NOW READY. Price 3s. 6d. net.

INTENSIVE TREATMENT OF SYPHILIS

and Locomotor Ataxia by Aachen Methods.

By REGINALD HAYES, M.R.C.S.

THE LANCET says:—"No better exposition of the method as practised at Aachen can be found than that contained in this little work."

London: BAILLIÈRE, TINDALL & COX,
8, Henrietta Street, Covent Garden, W.C. 2.

[COPYRIGHT.]

By REDFORD FENWICK, M.D.,
Senior Gynæcologist to The Hospital for Women, Soho Square.

UTERINE FIBROIDS.

2nd Edition. With Analysis of 609 Laparotomies.

"Dr. Fenwick's results are remarkably good."—THE LANCET.

Price 3s. 6d. post free.

COMMON COMPLAINTS OF WOMEN.

"Eminently practical."—THE MEDICAL TIMES.

Price 3s. 6d. post free.

HALE, SONS & DANIELSSON, LTD.,
83, Great Titchfield Street, W.

Pp. viii + 350. With 103 Illustrations.
Price 7s. 6d. net.

DISEASES OF THE RECTUM AND ANUS

BY

P. LOCKHART MUMMERY, F.R.C.S.

BAILLIÈRE, TINDALL & COX,
8, Henrietta Street, Covent Garden, W.C. 2.

By FRANK KIDD, F.R.C.S.
Assistant Surgeon at the London Hospital, and Surgeon-in-Charge of Genito-Urinary Department, London Hospital.

JUST PUBLISHED. Price 5s. net.

COMMON DISEASES OF THE MALE URETHRA.

Being a Course of Lectures delivered at the London Hospital, designed to assist those who may be starting Genito-Urinary Clinics. With numerous Illustrations and Appendices.

BY THE SAME AUTHOR.

URINARY SURGERY: A Review.

7s. 6d. net.

"This book can be thoroughly recommended to those who are desirous of being acquainted with the modern position of Urinary Surgery."—COLONIAL MEDICAL JOURNAL.

London: LONGMANS, GREEN & Co.,
39, Paternoster Row, E.C. 4.

[ISSUED WEEKLY.

Valentine's Meat-Juice

In Typhoid Fever, Diarrhoea and Cholera Infantum, when it is **Essential** to **Sustain** the patient **without irritating** the **Digestive Organs,** the **Ease** of **Assimilation** and **Power** of **Valentine's Meat-Juice** to **Restore** and **Strengthen** has been demonstrated in Hospital and Private Practice.

THE quickness and power with which VALENTINE'S MEAT-JUICE acts, the manner in which it adapts itself to and quiets the irritable stomach, its agreeable taste, ease of administration and entire assimilation recommend it to physician and patient.

Physicians are invited to send for brochures containing clinical reports.

For sale by European and American Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY,
Richmond, Virginia, U. S. A.

THE TECHNIQUE OF NERVE SUTURE.

BY

S. ALWYN SMITH, D.S.O., CH.M., F.R.C.S.EDIN.,

TEMPORARY MAJOR, R.A.M.C.,

ORTHOPAEDIC SURGEON IN CHARGE, WELSH METROPOLITAN WAR HOSPITAL, CARDIFF; LATE SURGEON IN CHARGE, GRANVILLE CANADIAN SPECIAL HOSPITAL, RAMSGATE.

THE experiences of nerve surgery here related were gained while acting as surgeon in chief at the Granville Canadian Special Hospital in Ramsgate.

This series of fifty cases covered a period of eight months in 1916. I regret that I was unable, owing to the demands of the military situation, to follow up the majority of my cases, as they were invalided to Canada at varying times from six weeks to six months after operation.

I desire to point out certain details of the operative technique, and, in addition, some of the general considerations of the treatment upon which stress is being laid by the profession at the present time. It has been possible to follow a few cases till results of operation began to manifest themselves, and full reports of six cases are appended. Cases A and B are complete lesions of the musculo-spiral nerve. Case C is an incomplete lesion of the external popliteal. Case D is an example of axillary aneurysm complicated by incomplete lesions of nerves of the brachial plexus. Case E is reported to show an exaggerated form of traumatic neuritis; Case F is one of complete anterior crural paralysis, anatomically unsuitable for suture, showing the results of tendon transplantation.

Cases of peripheral nerve lesions require uninterrupted treatment for a considerable length of time. This can only be obtained in suitable institutions, fully equipped, in order to be able to carry out the various forms of treatment required. On this account nerve suture work should only be done by surgeons attached to hospitals that can hold their cases so that they may be treated to finality. Tendon transplantation is often available in cases where nerve suture has failed, and no man should be finally discharged until the question of its advisability has been debated. I have transplanted the primary flexors of the wrist to the primary extensors in several cases during the last year where nerve suture had failed or was contra-indicated, and good results were obtained.

At the outset it is necessary to emphasize the point that surgery must go hand in hand with massage, electrical and postural treatment in nerve suture cases. Any institution where nerve surgery is performed must be adequate to deal with the case in all these particulars. The break in the treatment due to cases being sent from Ramsgate to Canada is unfortunate, but at present unavoidable. It would appear that the close co-operation between a surgeon and a neurologist is of importance. I was fortunate in having Major Colin Russel of Montreal as my co-adjutor, and was much helped by his enthusiastic support in the combined treatment of these cases.

All cases of complete lesion should be sutured as soon as they are diagnosed, provided they are fit for operation.

Cases due to bullet wounds that have healed rapidly may safely be operated upon within three weeks from the time the wound is healed. Wounds due to shrapnel or high explosive require a longer period, more especially when there has been bone involvement, destruction of tissue, with consequent scar formation, or when fine metallic bodies are present. These cases often take long in healing, and it is a good working rule to wait for at least three months after the wounds have well healed. Undue haste may be followed by sepsis on account of the latent infectivity that remains for a considerable period in this type of wound. I have operated on several such cases three months after healing, and have encountered small sequestra from healed comminuted fractures, small metallic fragments, and large areas of scar tissue. If a suspicious wound be swabbed with iodine and alcohol before the nerve is dissected out, and a small cigarette drain inserted for forty-eight hours after operation, no untoward accidents should occur.

In a series of fifty cases with a maximum length of time between wound and operation of eleven months, a minimum of three months, and an average of five and a half months, all healed by first intention. This high average length of time was due to the fact that the majority were due to shell wounds, and that all were transfers from general or convalescent hospitals in this country.

PRELIMINARY ELECTRICAL EXAMINATION.

On admission the average case is tested on three different occasions at intervals of a few days, during which time the daily conservative treatment by massage and electricity is instituted with whatever postural treatment is indicated, deformities being overcome at the earliest possible moment. The paralysed muscles are tested to faradism and galvanism, and on the nature of the response to the latter the diagnosis is usually made. It was found in a long series of cases that the results of the varying contractions produced by the anodal and cathodal opening and closing currents are somewhat variable. Great stress is laid on the sluggish reaction to galvanism and on the increased amount of current required to produce it.

Throughout the series all complete lesions, verified at the operation, displayed loss of irritability and a sluggish response to galvanism, and all cases failed to react to faradism, and the sensory disturbances were anatomically constant.

Cases showing prompt response to galvanism of some muscles and sluggish response in others supplied by the suspected nerve should be watched for improvement or otherwise, as a partial lesion combined with scar tissue infiltration may reasonably be expected to exist. Should no improvement occur within six weeks operation is indicated. The progress of such cases should be carefully watched, as the sensory disturbances vary considerably, and referred pain may occur on account of traumatic neuritis. Psychogenetic paralysis, of which a number of cases have been seen, can invariably be diagnosed by the stocking type of anaesthesia, the exaggerated deformity of the limb, combined with the brisk reaction of the alleged paralysed muscle groups to the faradic current.

CONSERVATIVE TREATMENT.

Conservative treatment is instituted at once, and must be continued without interruption—except during operative convalescence—for a long period of time, as on its persistence depends to a large extent the outcome of the case. Daily massage to the paralysed muscles is given for twenty minutes, with fifteen minutes of the galvanic current sufficiently strong to produce a fairly marked response. Should trophic conditions be present, as are constantly found in lesions of the median, ulnar, and sciatic nerves, "eau courante" or contrast baths are given as an adjunct to massage. Marked swelling and cyanosis of the fingers or toes, with sweating of the involved skin area in some cases, and friability of the nails, are the usual symptoms. Baths are contraindicated where trophic ulcers or whitlows are present.

Where marked trophic disturbances have existed for some time in combined nerve lesions—especially if complicated by osteomyelitis—conservative measures are of little avail and the question of amputation arises. This has been necessary in two cases; both showed complete lesions of median and musculo-spiral nerves, compound comminuted fracture of the radius with osteomyelitis, and discharging sinuses. Trophic ulcers of a persistent type were also present. Amputation through the forearm was done in each instance. A curious phenomenon is sometimes seen in post-operative cases of nerve lesion, generally three to six months after suture. Reactions to faradism remain negative, and reactions to galvanism become more and more difficult to obtain. Voluntary power may shortly appear in one or more of the paralysed muscles. In fact, a paradox sometimes is present, as the muscle has voluntary power but the electrical reactions are practically non-existent—no reaction to faradism and reaction to galvanism obtained with the greatest difficulty, and then, perhaps, with a small electrode only (see Case A).

POSTURAL TREATMENT.

The paralysed muscle groups must never be allowed to become overstretched by their opponents, or contractures will occur. The overstretching of a paralysed muscle, devoid of tonicity, if allowed to persist, may render the muscle incapable of contraction even after nerve conductivity is re-established.

I do not intend to describe at length the various splints devised to carry out this treatment, as they are well

known from the writings of Colonel Sir Robert Jones. In lesions of the musculo-spiral nerve the wrist and fingers should be kept hyperextended, lesions of the sciatic and popliteals require the foot to be kept at a right angle.

In cases in which there is damage to the cords of the brachial plexus or to the nerve trunks from which they are formed, individual appliances will be required to meet each case. The commonest injury that we have seen in this region is that which involves the anterior primary divisions of the fifth and sixth nerves, due to wounds in the neck. Here an appliance is required to keep the arm abducted and rotated outwards, the elbow flexed, the forearm supinated, and the wrist and fingers extended.

The long cock-up splint used for musculo-spiral lesions should have a thumb-piece to keep the thumb extended and abducted. The splint should be bent transversely in the centre of the palm to allow the hand to rest with the metacarpo-phalangeal joints flexed a little. This is to prevent the hyperextension that has been found to occur in these joints in long-standing cases, due no doubt to the hand slipping in the splint. Slight movement of the finger joints may be permitted by the masseur during the daily treatment. These movements increase the circulation in the part and prevent the formation of adhesions. Under no consideration, however, must undue stretching of the paralysed muscles be permitted at any time. Some cases of metacarpo-phalangeal stiffness have been brought to my notice presumably as the result of continued immobilization in a hyperextended position, but the alteration to the splint which was suggested by Colonel Sir Robert Jones has prevented recurrence of this complication.

Operative Procedure.

Before deciding on operative interference it is necessary that contractures of joints distal to the lesion, involving muscles supplied by the paralysed nerve, be duly corrected. Remarks previously made regarding the nature of the wound are applicable here.

Analysis of Cases.

Total cases	50
Nerves operated on	58
End-to-end suture	40
Catgut bridge	2
Nerve graft	1
Partial and scar cases	15
Covering of fascia lata "sleeve"	44
Obtained locally	2

Standing orders call for preparation of the skin of the thigh of the same side, from groin to knee, as well as at the site of operation. This is for the removal of the flap of fascia lata destined to act as the "sleeve," which is described later.

Relative Frequency of Lesion to Individual Nerves.

1. Ulnar	23	
2. Musculo-spiral	13	17
Posterior interosseous	4	
3. External popliteal	8	
4. Median	4	
5. Sciatic	2	
Internal popliteal	2	
6. Cords of brachial plexus	1	
Musculo-cutaneous	1	

As will be seen, more than one nerve was injured in several cases.

It is advisable in all arm cases to use a side table so that the arm may be abducted to a right angle and remain steady in that position. Where there is marked scar tissue formation it is advisable to make the incision in the line of the nerve above and below the scar, and to pick the nerve up at the upper and lower level where it lies in its true anatomical relationship with surrounding structures. The advantage of this procedure is obvious as it is a tedious task searching for a nerve imbedded in scar tissue. These nerves are often destroyed for a distance of one to three inches, so that large dissections are required above and below the site of injury to make up shortage sufficient to give end-to-end apposition. Whenever end-to-end suture can be obtained by any means nothing should be left undone to bring it about.

A catgut bridge was used on two occasions in large gaps where other means failed to get end-to-end apposition. The gap should be joined by chromic catgut sutures, and the whole covered in by a fascial "sleeve." However carefully the sleeve covers in the gap the chance of its becoming filled with blood clot, which organizes to form fibrous tissue, appears very considerable. If the gap is long it would seem that the operation defeats its own end. A case of reoperation where primarily, as far as one could judge, the nerve ends had been so joined showed dense scar intervening between the cut ends. In one case of lesion of the ulnar nerve in the forearm four inches were missing from the nerve when the ends were prepared. The nerve ends were grafted into the median. The result of the operation I do not know.

In dissection the nerve should be isolated above and below the fibrous tissue as before stated. The nerve should be carefully loosened from its bed at these points and a length of half-inch tape or cut gauze gently placed beneath it. Haemostats are attached to the ends of these tapes and so loops are formed on which gentle traction may be exercised while dissection of the nerve from above and below is made. This dissection will be found to be easy and without danger to surrounding structures. The use of the loops prevents the nerve being pressed on during dissection by the indiscriminate use of forceps. Where dissecting forceps need to be used a special type made by Messrs. Schaerer of Berne is useful. The end of each blade is shaped to half a circle and covered with fine rubber tubing, so that the nerve can be held without pressure. Three sizes of forceps are available.

Scar tissue should be dissected in the neighbourhood of the lesion after the nerve ends are isolated and freed. Stimulation of the nerve by means of the faradic current is now undertaken—above and below the lesion where dissection has not produced anatomical loss of continuity, below the lesion only where this loss exists. A Bristow coil with metronome interruption appears the most suitable apparatus—a pad can be placed on some part of the body away from the seat of operation. The nerve is now stimulated in the whole of its circumference by means of a single sterilized electrode—a long silver probe is advised by Mr. Bristow of the London Military Orthopaedic Hospital; I have also used a twin electrode with success. The faradic current thus applied will readily determine as to whether the lesion is complete or partial if applied to healthy nerve above the block. In the vast majority of cases no reaction is obtainable in complete lesions when the electrodes are applied below the lesion, as the lower end degenerates in a few days.

Should the lesion be complete the preparation of the ends for suture should be the next step.

If definite nerve bulbs are found these should be cut transversely at distances of one-eighth of an inch until healthy nerve tissue is encountered. The fibrous end of the nerve should be held with mouse-tooth forceps and the cross sections made with a sharp knife, almost but not quite through the nerve. This plan obviates undue handling of the nerve, which is only touched by the forceps at its fibrous end. When healthy nerve is recognized by the protrusion of the bundles, the last made section is completed. On no account should nerve sections be made with scissors, which cause crushing of the fibrils. The nerve sections are sent to the laboratory, and slides are made as a routine.

The amount of shortage in the nerve can now be gauged, and steps taken to make this good, so that end-to-end suture can be accomplished. The shortage can be overcome in four ways:

1. By flexion of intermediate joints.
2. By free dissection of the nerve for a considerable distance above and below the lesion.
3. By translation of the nerve path to a straight line.
4. By dislocation of the nerve.

The first and second only are applicable to nerves of the lower extremity; the third is applicable to the ulnar and musculo-spiral, and the fourth is referable only to the ulnar at the elbow-joint. By these various means a gap of over two inches has been readily overcome.

I have chosen the example of an ulnar nerve lesion in the forearm for the purpose of description of the closing stages of the operation as it is in this situation that the worse types of nerve shortage occur. The nerve must not be unduly pulled upon, although a certain amount of gentle traction is permissible if necessary, as there is little doubt that the sheath is shorter than the nerve fibres.

With regard to shortage in the ulnar nerve free dissections must be made to the middle of the upper arm and the nerve is dislocated from its tunnel behind the internal condyle and brought to the centre of the antecubital fossa. The nerve must be dissected high enough up the arm to enable it to be brought in a straight line from the axilla to its normal position in the forearm. The new course of the nerve causes it to lie between the superficial muscles of the forearm behind and the fascia and fat superficially. In making the dissection great care and gentleness must be exercised, and the sheath must not be injured. Careless and rough handling of the nerve is to be deprecated. The procedure is obviously not applicable to a nerve where it is giving off muscular branches.

Objections may be raised to the cutting of the nerve from its blood supply for such a distance. It has been shown clinically in cases of fracture in the region of the elbow with bone overgrowth interfering with the ulnar nerve, that the operation of free dissection with dislocation causes no ill effects as evidenced by loss in conductivity. Here the nerve must be similarly deprived of its blood supply.

The aponeurotic band between the two heads of the flexor carpi ulnaris must be divided with care as one wishes to conserve the branches to this muscle and to the ulnar head of the flexor profundus digitorum which come off at this level.

Where the lesion is below the level of the middle of the forearm it is sometimes convenient to free the nerve with a dissector beneath the muscle, and to push the upper segment upwards, bringing it out through the opening made between the two heads of the muscle. This was done on two occasions without damaging the two nerve branches before mentioned. This method is quicker and causes less trauma than the full dissection of the flexor carpi ulnaris, which is the only alternative. The bringing of the ulnar nerve superficial to the flexor carpi ulnaris in the upper half of the forearm lengthens it by more than half an inch. By these means almost any gap that is likely to be encountered in ulnar nerve lesions may be overcome, and the cut end of the nerve should now come together without tension.

A temporary stitch of fine catgut is placed through the nerve ends with a fine non-cutting needle at a distance of about half an inch from each extremity. This stitch aids the surgeon in the permanent suture. The nerve is sutured by means of the finest domestic sewing needle and the finest white sewing silk obtainable. I would advise the use of the No. 9 "calyx" self-threading needle, which is obtainable in drapery establishments. A continuous stitch is put round the nerve, involving nothing but its sheath. This will be found to be easy as, despite the protrusion of the bundles, the sheath is capable of being stretched. It is important that eversion of the sheath edges be brought about, and very fine and accurate stitching is necessary to produce this result. This eversion will minimize the risk of subsequent interstitial fibrous formation. The catgut "stay" stitch is now removed and the whole circumference of the suture examined. An autogenous graft of fascia lata is now removed from the thigh. The outer side of the thigh about its centre is opened by means of a semicircular incision involving the skin and subcutaneous fat. This flap is now turned down and the fascia lata is seen. A parallelogram of fascia is now removed, varying in size with the calibre of the nerve it is desirous to cover. It is well to err on the large side, as the fascia tends to contract on separation and the "sleeve" must be easy fitting. I use the term "sleeve" advisedly to emphasize the fact that an easy fit is essential and the covering should bear the same relationship to the nerve that a sleeve does to the arm. The fascia when removed from the subjacent muscle will be found to strip quite easily on account of the areolar tissue that exists between the two. This side must be the one in contact with the nerve.

It will be found advisable to grip the corners of one long side with mosquito forceps. Two similar haemostats are placed beneath the nerve and these grip the corresponding corners of the other side of the flap. The flap is now drawn beneath the nerve and the haemostats brought into apposition at the upper and lower ends. An end-to-end suture of the long edges is done with chromic catgut, leaving long ends at the top and bottom. A tube of fascia now envelops the nerve with a length of catgut at either end. By this means the "sleeve" can be slid up or down the nerve until its centre covers the suture line. The "sleeve" is now anchored to adjacent tissue both top and bottom with the catgut ends before mentioned.

I have emphasized this method as some such scheme will be found to save time on account of the marked propensity for curling up that the fascial flap always displays.

The reason for the preference of fascia lata over local fascial flaps is twofold, namely: (*a*) The amount of areolar tissue present on the inner side of the fascia lata. This appears to prevent strong fibrous union to the subjacent nerve sheath. (*b*) Latent infection may lurk in tissues in the region of the initial wound where suppuration has existed.

The disadvantages of a second wound appear to be slight, for if the hole in the fascia lata be well sutured with chromic catgut and the patient kept in bed for fourteen days, the risk of a quadriceps hernia is remote. I have no experience in the use of Cargile membrane as a covering. It is well spoken of by some of my colleagues. As I have had no trouble in any of my cases, I hesitate to begin using a foreign body where an autogenous graft is available.

All cases of complete nerve lesion do not show the bulbous ends previously described. After dissection, the nerve sometimes appears normal to the eye. On palpation, the fibrous block is generally recognizable, as it feels harder than normal nerve. Should faradic stimuli fail to pierce the block, it is advisable to divide the nerve at its hardest point and then to section each end until healthy nerve is reached. Where interstitial fibrosis is present one feels a grating sensation on the knife when making the section of the nerve.

Where there is much destruction of nerve and translation is not available, as in the median and sciatic, it is sometimes necessary to dissect out fibrous tissue from between the nerve bundles instead of sectioning until healthy nerve is reached. This is done in order to procure end-to-end apposition when it cannot be otherwise obtained. A fine-bladed knife, such as a von Graefe, will be found useful, and careful dissection is necessary.

Partial lesions require careful dissection, as it is probable that two or more bundles retain their conductivity. All scar tissue must be removed from the site of lesion until healthy bundles are seen. A wedge-shaped gap is now found to be present, and some dissection of the nerve from its bed will be necessary to coapt the edges of this gap without tension. When the suture is complete the nerve displays a bulge at this level. In one of the cases in the series the nerve after dissection showed that only one bundle retained conductivity, and the gap of destroyed nerve tissue was very wide. Here a complete section of the nerve with end-to-end suture was made. It was felt that on account of the wide gap strangulation of the remaining bundle would occur if the case were treated as a partial lesion.

Some cases display no damage to the nerve bundles, but nevertheless the lesion is apparently complete. When the scar tissue is removed the calibre of the nerve is much lessened, and it may even be quite flattened. Occasionally the nerve will be seen to bulge at the seat of injury immediately the constricting bands are divided (Case D). It is advisable to divide the nerve sheath longitudinally in one or more places at the site of the lesion, and to cover the area with a sleeve of fascia lata. This is to counteract adaptive contracture of the sheath that has probably occurred.

Referred pain occurs solely in partial lesions due to scar pressure from without or within the nerve sheath. Free removal of all fibrous tissue is necessary, both surrounding the nerve itself and also between the individual nerve bundles, and a fascial sleeve must be used. Case E is of interest in this respect in that it shows what occurs to the fascial flap after it has remained *in situ* for some time.

Where flexion of joints has been necessary to procure end-to-end anastomosis, six weeks should elapse before any extension is permitted, and this should be very gradually brought about.

In the suturing of small nerves a straight needle is often a disadvantage. This applies especially to the posterior interosseous, which, in my experience, is the most difficult to suture. It is possibly better practice to transplant tendons at the outset instead of suturing this nerve, especially if the damage has occurred after the supinator

brevis has been pierced. The flexor carpi radialis can be attached to the three extensor tendons of the thumb and to that of the index finger, and good results have been quickly obtained. "Calyx" needles are not made in curves, and I found it impossible to obtain self-threading, curved, non-cutting needles of sufficient fineness. Sir Edward Rigg, C.B., an authority on metallurgy, has given me great help in showing me how to make one's own curved needles.

By the careful drawing of the temper of "calyx" or other domestic needles, they may be bent to any desired curve without losing their point, strength, or resiliency. The needles are heated on a metal plate by means of a spirit lamp. The plate must be sufficiently large to prevent any of the gases of the flame coming into contact with the needles, which must be constantly kept in motion whilst being heated. The needles are heated beyond the straw stage to a light blue, and then they are rapidly transferred by forceps to a cold plate of metal. Here they immediately turn dark blue. By means of a specially made pair of pliers, whose blades are concavo-convex and graduated, any desired curve may be wrought on the needle. I mention this point in case others find the same difficulty in obtaining suitable needles.

AFTER-TREATMENT.

I wish to emphasize the fact that peripheral nerve lesions require prolonged after-treatment. This should be given in institutions suitable to the purpose at which the soldiers can attend as out-patients. The institution should be equipped with complete therapeutical establishments, and also with curative workshops. These workshops are used for functional re-education. Where needed, arrangements should be made for professional re-education, which should go hand-in-hand with the military orthopaedic treatment. The full consideration of this matter, which is provoking much discussion in military circles at the present time, does not come within the scope of this paper. The matter is being diligently and thoroughly taken up by the Pensions Minister.

Complete Lesions.

CASE A.

Capt. T. Gunshot wound through centre of upper arm (left), December, 1915.

Preliminary examination showed sluggish reaction of all muscles supplied by the musculo-spiral nerve, with the exception of the triceps; larger galvanic current required than on corresponding muscles of the other arm. No response to faradism. Treatment for six weeks by massage and galvanism, and long cock-up splint.

Operation (April 30th, 1916).—Exposure of left musculo-spiral nerve from where it perforates external intermuscular septum. Nerve found bound down on the mesial aspect; all adhesions freed. Two bulbs lying within half an inch of each other and attached together by fibrous tissue were found. The bulbs were separated and sectioned until healthy nerve fibrils appeared. End-to-end suture with fine silk. Junction covered by fascia lata "sleeve." After-treatment: Massage, "eau courante" baths, galvanism, and long cock-up splint.

November 1st. Reaction to galvanism very sluggish and difficult to obtain; strongest current and fine button electrode required—this after several attempts. No reaction to faradism. Voluntary power in supinator longus and extensor carpi radialis longior appearing.

December 5th. Voluntary power beginning in extensor carpi ulnaris; short cock-up splint substituted.

January 7th, 1917. No reaction to faradism in extensors of wrist and fingers. Reaction to galvanism so slow and weak as to be scarcely perceptible.

March 12th. Strong voluntary power in primary extensors of the wrist. Voluntary power in extensors of fingers beginning; can extend fingers with wrist slightly hyperextended. On home service at present.

CASE B.

Pte. S., Canadian Infantry. Admitted August 31st, 1916. Gunshot wound of outer side of right arm 2 in. above the elbow, emerging at back of arm midway between elbow and shoulder, on June 3rd, 1916. The humerus was not touched. Drop-wrist came on immediately; there is loss of sensation over the radial side of the dorsum of the hand. Extensors of wrist and fingers do not react to faradism, and only sluggishly to galvanism, with the exception of the extensor carpi radialis, which responds promptly.

Operation (September 25th).—A 5-inch incision over the course of the musculo spiral nerve on the outer side of the humerus was made. The nerve was exposed, and a block of fibrous tissue found. There was no conductivity to faradism, either above or below the lesion. Nearly an inch was removed, healthy fibrils obtained, and end-to-end suture performed. "Sleeve" of fascia lata used to cover the junction; wound closed with catgut and clips. Long cock-up splint applied. After convalescence, conservative and postural treatment continued.

March 9th, 1917. Supinator longus and extensors of wrist and fingers do not react to faradism; reaction to galvanism slow and weak. The patient has voluntary power in supinator longus and extensor carpi radialis longior, and slight voluntary power in extensor carpi ulnaris. Treatment continues.

Incomplete Lesions.

CASE C.

Cpl. W., C.M.R. Admitted January 17th, 1916, with history of shell wound of left thigh on December 8th, 1915. Immediately after being wounded was unable to flex ankle or extend toes. Two days later phlebitis supervened. For two weeks after the injury a numb feeling was complained of all over the foot and up about the knee-cap. Wounds in thigh not healed. Foot kept at right angle with a Thomas rectangular shoe.

February 16th. Tibialis anticus and peronei react to condensed current. All muscles react to galvanism promptly, and with small current. Partial lesion of external popliteal diagnosed. Patient walks with boot and fixed posterior iron to prevent foot-drop.

May 16th. Voluntary power returning in anterior tibial group; no power in peronei.

June 14th. Peronei and extensor communis digitorum do not react to faradism. Tibialis anticus has regained voluntary power.

July 21st. No improvement.

August 7th. Voluntary power of anterior tibial group has quite gone. Muscles react poorly to galvanism. Operation advised.

Operation (August 10th).—An 8-inch longitudinal incision in mid posterior line of left thigh from level of tuber ischii. The great sciatic was isolated at the lower level of the gluteus maximus. The sciatic was found to divide into the popliteals at a high level. Both trunks were imbedded in scar tissue, especially the external one. The external popliteal was dissected from the scar tissue, but the sheath appeared intact, and palpation could discover no hard points on the nerve. Conductivity to faradism was poor but complete, much inferior to that of the internal popliteal, from around which all fibrous tissue was removed. A longitudinal incision was made in the sheath of the external nerve 1½ in. long; a "sleeve" of fascia lata covered the nerve at this point.

September 14th. Regaining voluntary power in anterior tibial group; can voluntarily flex the ankle.

September 26th. Invalided to Canada.

February, 1917. A letter from the patient states that he has continued to improve, and is very pleased with the result.

CASE D.—*Incomplete Lesion complicated by Aneurysm.*

Pte. K., Canadian Infantry. Admitted April 6th, 1916, with a history of shell wound, September 22nd, 1915. A shrapnel bullet entered the posterior fold of the left axilla, and emerged through the pectorals on the right side about two inches to the mesial side of the anterior fold of the right axilla. In the left axilla there is an expansile swelling as large as a hen's egg. There is little loss of sensation in any part of the arm. There is complete wrist-drop and inability to flex and to separate the fingers. Voluntary power in the triceps; the supinator longus and extensors of wrist and fingers do not react to faradism, and but slowly to galvanism; reaction is more easily obtained by the anodal than by the cathodal closing current (ACC>CCC). The muscles of the median and ulnar distribution show marked weakness and voluntary power is all but lost; react promptly to galvanism.

Operation (April 27th).—(*a*) Ligation of first part of axillary artery. (*b*) Eight-inch incision over line of the vessel. Axillary border of pectoralis major divided and reflected. All nerves of the plexus lying anterior were found to be closely adherent to the sac and were obviously stretched. Nerves stripped from sac wall. Sac opened and clot turned out. Sharp haemorrhage checked. Sac excised with difficulty and vessel tied above and below. The musculo-spiral nerve was found in its position at the back of the sac and tacked down to it. Scar tissue removed from the nerve, which was found constricted and flattened, but on division of the constricting band expanded slightly.

May 29th. Extensors of wrist and fingers react fairly to galvanism. Voluntary power has returned in median and ulnar distribution. Circulation in arm and hand well compensated. Invalided to Canada with symptoms of musculo-spiral lesion only.

CASE E.—*Incomplete Lesion of Great Sciatic Nerve with Traumatic Neuritis, Causing Great Pain, so that Patient was Bedridden for Fifteen Months.*

Pte. C., Canadian Infantry. Admitted March 27th, 1916, with history of shell wound of lower third of left thigh on April 25th, 1915. Complains of extreme constant pain in foot and leg ever since being wounded.

Previous Operations.—(1) Foreign body removed in France. In other hospitals: (2) Removal of scar tissue from sciatic nerve, June 2nd, 1915; (3) removal of scar tissue from sciatic nerve, September 6th, 1915; (4) removal of scar tissue from sciatic nerve, and nerve wrapped in saphena vein, January 1st, 1916.

No improvement in the pain followed any of these operations, and the patient has never been out of bed, as he cannot bear to have the leg touched. it is so hyperaesthetic. The leg is flexed on the thigh to 45 degrees, and there is bad foot-drop with

contracture of the tendo Achillis. Marked hyperaesthesia to cotton-wool stimulation on the sole and on the outer side of the foot.

Fifth Operation.—Division of tendo Achillis and forcible extension of the knee with the hope of stretching nerve fibres and diminishing pain. Scar was felt to stretch in the popliteal space. Slight alleviation of pain for two days, but it recurred.

Sixth Operation (May 24th).—Removal of scar, freeing nerve and fascial "sleeve." Both popliteal nerves were found surrounded by large areas of fibrous tissue. Both nerves were freed from scar as much as possible, and this extended for 3 in. above their junction. The nerves felt hard and fibrous, but to such an extent that further treatment seemed contraindicated. Fascial sheaths taken from both thighs 6 in. by 2 in.; invested both popliteals and the sciatic like a pair of trousers. All three nerves injected with 5 c.cm. normal saline above and below the "sleeves." Temporary relief was obtained for a week but the pain afterwards recurred.

June 18th. Pain as before and foot oedematous.

July 4th. As patient continues to lose weight and is very depressed it was decided to sacrifice the "sciatic" nerve. This on account of the length of time the patient has been in bed (fifteen months), although there is voluntary power in extension of the ankle.

Seventh Operation (July 6th).—Excision of sciatic nerve at the junction. Four inches removed, which included repair work of operation No. 6, with fascial covering.

July 10th. All pain gone; anaesthesia in foot.

September 19th. Patient invalided to Canada; boot and iron to prevent drop-foot.

Microscopical Report on Nerve Section.—Several large bundles of nerve separated by much dense—in places hyaline—connective tissue, in which are imbedded groups of inflammatory cells and also foci of endothelial cells laden with brown pigment; old haemorrhage. In all nerve bundles there is considerable destruction of fibrils and their sheaths, often with replacement fibrosis. In parts at the periphery of the section a layer of connective tissue is seen, in some parts separated from, and in other parts attached to, the subjacent connective tissue covering the nerve bundles. The section shows to what extent interstitial fibrosis may occur when the nerve sheath is damaged. Conversely, it shows the uselessness of dissecting the nerve from surrounding scar when on palpation the nerve feels in the least degree hard or nodular. The layer of connective tissue referred to above consists of the fascial flap that had been put in position six weeks previously. It shows that the "sleeve" does not unduly adhere to the nerve sheath.

CASE F.—*Tendon Transplantation in a Case where Nerve Suture was Impossible.*

Pte. L., Canadian Infantry. Admitted December 24th, 1915, with history of having been hit by a bullet in the left groin on November 16th. The bullet emerged posteriorly in the region of the left sacro-iliac joint. Wounds closed on admission.

The left thigh is markedly atrophic—two inches less in circumference than the right. Cannot extend leg on the thigh, and cannot raise the patella. The quadriceps muscle does not react to faradism, and only sluggishly to galvanism. Matted glands and adhesions causing a marked mass felt on palpation in left pelvis. Thomas's walking knee-splint applied; massage and galvanism.

May 17th, 1916. No voluntary power in quadriceps; no reaction to faradism, and only sluggishly to galvanism. Apparently a complete lesion of the anterior crural. Suture contraindicated for anatomical reasons. Tendon transplantation advised.

Operation (June 16th).—Vertical incision twelve inches long on outer side of popliteal space. Biceps isolated and separated from head of fibula. From a corresponding incision on the inner side the semitendinosus was separated from its insertion. A channel was made between the deep fascia and the aponeurosis of the vasti through a 4-inch vertical incision in the suprapatellar region. The tendons were brought through this opening to the patella from their respective sides. Each tendon was fixed to the patella by means of a tunnelling process, which fixed them subperiosteally on the anterior surface. Sutured with No. 3 chromic catgut; wounds closed.

September 16th. Walking well; full extension possible voluntarily, and 45 degrees flexion of knee permitted.

September 26th. Discharged in England.

THE June issue of the *Edinburgh Medical Journal* is entirely given up to the medical and surgical aspects of child welfare, and forms the second collective report on this subject published by our contemporary. Dr. Claude Ker deals with infectious diseases; Dr. Norman Walker and Dr. R. Cranston Low with dermatology; Mr. J. V. Paterson and Dr. H. M. Traquair with diseases of the eye; Mr. J. S. Fraser with diseases of the ear, nose, and throat; and Mr. J. H. Gibbs, who is an able exponent of the views of Dr. Sim Wallace, with the prevention of dental disease. Each of these subjects is treated from the immediate point of view of child welfare. Dr. J. Hally Meikle contributes a chapter on medical inspection and supervision of school children in Edinburgh; and Dr. and Mrs. Leslie Mackenzie write on administrative institutions and regulations, and certain legal aspects of the subject.

C

OBSERVATIONS ON CHLORAMINES AS NASAL ANTISEPTICS.*

BY

E. K. DUNHAM, M.D., AND H. D. DAKIN, D.Sc., F.R.S.

(Report to the Medical Research Committee.)

THE valuable results obtained by Gordon and Flack[1] on the use of chloramine-T, zinc sulphate, and other antiseptics for the treatment of meningococcus carriers among soldiers, led us to undertake some experiments on the influence of certain antiseptics on the total bacterial count of the nasal secretions of apparently normal individuals. It would appear that such experiments might furnish information which could be utilized in a practical way for the treatment of certain types of carriers. On submitting our results to Colonel Gordon he expressed the opinion that they possessed some interest in relation to the carrier problem, and we are thus led to record a short account of them.

The problem of destroying pathogenic organisms in the nasal cavities and upper air passages by direct disinfection is a difficult one. There are, undoubtedly, many carriers with anatomical abnormalities of the nose, pharyngeal vault, and tonsils, precluding immediate contact with solutions used either as sprays or gargles. In such cases there is little if any prospect of any antiseptic proving effective. On the other hand, the fact that the chloramines do not cause precipitates or coagula in secretions or exudates is favourable to their acting upon micro-organisms contained in these fluids. Experiments made by Gordon and Flack on meningococcus carriers among soldiers, in which they used a solution of chloramine-T[2] reduced to a very fine spray with a current of superheated steam, have given decidedly encouraging results.

Our first experiments were merely modifications of those of Gordon and Flack, and were made on the normal noses of healthy individuals. A high-pressure jet of air replaced steam, and the fine spray so produced was inhaled from a double cone of celluloid, which obviated the use of a closed chamber. The coarser droplets from the spraying nozzle were caught by diaphragms and returned to the reservoir from which the antiseptic solution was drawn, thus effecting a considerable saving.

With this apparatus, using a 0.5 per cent. solution of chloramine-T and sufficient salt to make it approximately isotonic, we found it possible to secure a very considerable reduction of the bacteria in the nasal secretions, occasionally obtaining sterile agar plates with the swabs used for collection. It was necessary, however, to continue the treatment for half an hour to attain this. Such a protracted treatment militates greatly against the method; it is probable that the concentration of the antiseptic actually present at a given time is insufficient to act promptly. The use of more concentrated solutions seems unwise, because it would be likely to prove irritating in many cases. We therefore turned our attention to other means of prolonging the time of contact without increasing the concentration, and finally had recourse to the use of an oily medium.

Chloramine-T, while freely soluble in water, is practically insoluble in oils. But the corresponding dichloramine (toluene-*p*-sulphodichloramine, $CH_3.C_6H_4.SO_2NCl_2$, to which we now propose to assign the abbreviated name of dichloramine-T), though very sparingly soluble in paraffin oil, is quite readily dissolved in eucalyptol. The resulting solution can be subsequently diluted with paraffin. In this way a reasonably bland oil solution, containing as much as 2 per cent. of the dichloramine, can be obtained. It is with such solutions of different strengths that our second series of experiments was made.†

* "Chloramines" are substances containing chlorine linked to nitrogen, almost all of which possess marked germicidal properties. Hitherto the most widely used member of this group is sodium-toluene-para-sulphochloramide, $CH_3.C_6H_4.SO_2Na.NCl$, which is known under the name of chloramine-T and also a variety of trade names. The related dichloramines contain the NCl_2 group and are mostly sparingly soluble in water, but more readily soluble in organic solvents. A study of the germicidal action of these bodies will be found in the *Proc. Roy. Soc.*, B, 89, p. 232, 1916.

† It may be worth noting that Captain Sweet and Dr. Lee, at our suggestion, have investigated the use of a similar mixture containing 5 per cent. of dichloramine-T as a surgical dressing for infected wounds. The results will be published shortly and are said to be distinctly encouraging.

It should be noted that both of these oils combine with chlorine, and in order to obtain reasonably stable solutions it is important to reduce their avidity for this element by previous chlorination. The manner in which this was done and the mode of preparing the dichloramine solutions used are described below.

When the oil solution of dichloramine comes in contact with aqueous liquids a part of the chloramine passes into the latter. The former, therefore, serves as a reservoir from which the chloramine can be drawn to maintain a certain concentration of active antiseptic in the watery medium with which it is in contact. Experience showed that the active chlorine contained in the antiseptic was not exhausted after two hours, when a 2 per cent. oil solution was sprayed into the nose. By the use of this method, therefore, the action of the chloramine could be maintained without discomfort for a much longer time than when aqueous solutions alone were used. There is, however, one disadvantage in the use of oil alone. It is not as efficient in removing inspissated secretions as are watery solutions. Our choice has therefore been to cleanse the nose with an aqueous spray or irrigation, and then to apply the oil with a spray as thoroughly as possible.

The main results of our experiments with aqueous and oil solutions are summarized below.

I. Experiments with Aqueous Chloramine-T.

Experiments were made with a 0.5 per cent. solution of chloramine-T, inhaled through the nose as a fine power spray. Inhalation of this mist is not irritating, but causes a prompt increase in nasal secretion. For this reason, a control sample of the secretion was not taken until one minute after beginning treatment. All the samples for bacteriological examination were collected with sterile swabs of absorbent cotton, which were immediately immersed in a small quantity of a sterile solution of sodium thiosulphate to arrest any further action of the antiseptic. The whole swab, together with the thiosulphate solution, was then used in making agar plate cultures. After from two to four days' incubation, the number of colonies appearing on these was counted.

In Table I the average of the six experiments in which the periods and mode of treatment were the same is given, and, for comparison, a similar experiment in which normal salt solution replaced that of chloramine-T.

The treatment included two periods of fifteen minutes each, with a pause of from thirty to forty minutes between. Samples for bacteriological examination were taken at intervals of five minutes, necessitating an interruption of about one minute in the application of the spray. This lost time is excluded from the table.

Table I.—*Aqueous Chloramine-T and Neutral Salt Solution.*

	Number of Colonies Derived from Sample.					
	First Period.			Second Period.		
Time of treatment:	5 min.	10 min.	15 min.	5 min.	10 min.	15 min.
0.5 % chloramine-T (control, 43,240)	1,331	707	556	439	153	17
Normal salt solution (control, 55,738)	12,352	121,620	13,587	2,137	10,055	34,339

II. Experiments with Oil Solutions of Dichloramine.

Applications of the oil solution of dichloramine-T to the nose were made with an atomizer designed for paraffin oil, and from ten to twenty vigorous compressions of the bulb used for each nostril. The strength of solution and intervals of time between applications varied considerably. A brief preliminary treatment with an aqueous solution of chloramine-T was frequently employed to cleanse the nasal passages, and the oil was then not applied until the augmented secretion had subsided. The manner of collecting and examining samples of the secretion was identical with that already described, save that no sample bacteriological test was made less than half an hour after the application of the antiseptic, and the interval is usually an hour or longer.

While these experiments were in process there were no precautions taken to exclude intercurrent access of bacteria to the nose from the air, and in those of longer duration the subject of the experiment frequently went out of doors and was exposed to the dust of the streets. On three occasions, oil sprays taken just before retiring at night resulted in sterile swabs on rising the next morning, without further treatment. In these cases the nose was normal and perfectly free, and there is good reason to believe that the oil had reached all parts of the nasal passages.

Table II.—*A Few Representative Results with Oil Solutions.*

Treatment Employed.	Applications of Oil between Tests.	Time of Test, from Beginning of Treatment.	Number of Colonies on Agar Plate.
I. 0.5 % aq. chloramine-T followed by 2 % dichloramine-T in oil	0	0	42,240
	1	30 min.	9
	0	60 ,,	0
II. 1 % dichloramine-T in oil	0	0	1,150
	1	1 hour	590
	0	1.5 hours	1,750
	0	2 ,,	140
	0	3 ,,	145
	0	5 ,,	39
	0	7 ,,	135
III. 0.25 % dichloramine-T in oil	0	0	625
	1	0.5 hour	860
	0	1.5 hours	155
	0	3 ,,	150
	0	3.5 ,,	25
IV. 1.5 % dichloramine-T in oil	0	0	16,104
	1	1 hour	175
	1	3.5 hours	1
	0	6 ,,	9
V. 0.1 % aq. chloramine-T followed by 1.5 % dichloramine-T in oil	0	0	105,600
	2	1 hour	10
	1	2 hours	12
	1	3 ,,	3
	0	4 ,,	10
VI. 0.5 % aq. chloramine-T followed by 1.3 % dichloramine-T in oil	0	0	1,800
	2	1 hour	0
	2	4 hours	0
	0	5 ,,	20
VII. 1.25 % dichloramine-T in oil	4	1 hour	15
	0	1.5 hours	370
	0	2.5 ,,	665
	3	17 ,,	0
VIII. 0.5 % aq. chloramine-T followed by 1.3 % dichloramine-T in oil	0	0	6,129
	1	1 hour	8,960
	4	4 hours	87
	0	20 ,,	1,980
	1	22 ,,	59
	1	24 ,,	3
	1	26 ,,	1
	1	27.5 ,,	20

The weight of oil ejected from the spray with one vigorous compression of the bulb was approximately 18 mg. The total amount of antiseptic solution introduced into and finding lodgement in the nose was therefore very small—never over 15 mg., usually very much less. Bearing in mind the extent of surface treated, and that the presence of the oil precludes immediate action of all the antiseptic, it is evident that the germicidal efficiency of the dichloramine-T is of a high order.

As already stated, the incentive to these studies was to learn the adaptability of the chloramines used to the treatment of carriers. The results briefly summarized in Tables I and II warranted the belief that this application was worthy of trial.

Not ourselves having opportunity to treat carriers, this undertaking has been assumed by others, and is now in progress. There were no available meningococcus carriers in the neighbourhood of our work, but some observations have been made upon those carrying pneumococci or diphtheria bacilli, the latter mostly young children or infants and difficult to treat. The results obtained up to the present time are decidedly encouraging, but too few in number to warrant definite conclusions. We venture however, to append an outline of the treatment suggested, although fully aware that clinical experience may indicate that it might well be modified in certain particulars.

Use of Chloramine-T and Dichloramine-T in the Disinfection of the Nasopharynx of Carriers.

In the light of the experience hitherto gained, it seems important to follow as closely as possible the following procedure:

1. Cleanse the nose with salt solution or with 0.25 per cent. aqueous chloramine-T solution, either by spraying several times, using the handkerchief between applications, or by irrigation. The same chloramine-T solution should also be used as thoroughly as possible as a gargle.

2. After this preliminary cleansing, and when the augmentation of nasal secretion has subsided, apply the oil solution of dichloramine-T with an oil atomizer, endeavouring to reach all parts with an abundant supply of the oil. It is not certain that the oil introduced in this way continues active for more than two hours. For intensive treatment it should be renewed at the end of that time. In any case, it would seem important to repeat spraying with the oil at such intervals as to make at least four oil treatments daily at about equal intervals of time.

The first few applications of the oil sometimes occasion sneezing, but the nose appears to acquire a tolerance of the treatment, and subsequent applications cause no inconvenience.

As with all antiseptics, there are three factors governing success which must be constantly borne in mind: (1) There must be good contact with the parts to be acted upon; (2) there must be an adequate concentration of the antiseptic; (3) this must be maintained an adequate length of time. When the concentration is of necessity restricted, the time of action must be correspondingly prolonged. It is to attain this last desideratum that the treatment with an oil solution is recommended, but even so the actual amount of antiseptic applied to the nasal mucosa is not very considerable, although larger in quantity and in a more persistent form than could be tolerated in aqueous solution.

METHOD OF PREPARATION.

The preparation of the substances employed in these experiments is as follows:

Dichloramine-T, $CH_3.C_6H_4.SO_2NCl_2$. This substance was first prepared by Chattaway,[3] and the following details are based on the method employed by him.

Bleaching powder (350 to 400 grams) of good quality is shaken with two litres of water on a shaker for an hour, and then the mixture allowed to settle. The supernatant fluid is siphoned off and the remainder filtered. Powdered toluene-para-sulphonamide, 75 grams, is then added to the whole of the hypochlorite solution and shaken till dissolved. The solution is filtered if necessary, placed in a large separating funnel, and acidified with acetic acid (100 c.cm.) added in portions. About 100 c.cm. of chloroform is then added to extract the dichloramine, and the whole well shaken. The chloroform layer is tapped off, dried over calcium chloride, filtered, and allowed to evaporate in the air. The residue is powdered and dried *in vacuo*. It is sufficiently pure for most purposes without recrystallization, and it is not necessary to use a pure toluene-para-sulphonamide in its preparation, as objectionable impurities likely to be present are removed in the preparation of the dichloramine.

An alternate method of preparation is as follows:—Toluene-para-sulphonamide (50 grams), water (500 c.cm.), crystallized sodium acetate (100 grams), and chloroform (100 c.cm.) are placed in a flask, which is immersed in cold water, and the contents treated with chlorine gas to saturation. If necessary, more chloroform is added to dissolve the dichloramine completely. The chloroform is separated in a funnel, washed with a little water, dried over calcium chloride, filtered, and allowed to evaporate. The crystalline residue of pure toluene-para-sulphondichloramine is powdered and dried *in vacuo*. The yield is practically the theoretical.

Preparation of Chlorinated Eucalyptol for Use as Solvent.

Eucalyptol (*British Pharmacopoeia* or *United States Pharmacopoeia*), and not eucalyptus oil, must be used. Five hundred c.cm. is treated with 15 grams of potassium chlorate and 50 c.cm. concentrated hydrochloric acid for twelve hours or longer; it is then well washed with water and with sodium carbonate solution. After this the water is tapped off and 15 grams of dry sodium carbonate is added to the oil and the whole allowed to stand for twenty-four hours. It is then filtered, dried with a little solid calcium chloride, and is then ready for use.

Preparation of Chlorinated Paraffin Oil for Use as a Diluent.

To 500 c.cm. of commercial liquid paraffin oil 15 grams of potassium chlorate and 50 c.cm. of concentrated hydrochloric acid are added and the mixture exposed to light, preferably sunlight, for several hours. It is then transferred to a separating funnel and washed successively with water, a solution of sodium carbonate, and again with water. The opalescent oil is then tapped off, solid calcium chloride added in small quantity, and about 5 grams of animal charcoal. On subsequently filtering through paper a clear, slightly yellowish oil is obtained, which is ready for use.

Preparation of the Oil Solution of Dichloramine-T.

Dissolve 0.2 gram of the dichloramine-T in 2 c.cm. of the chlorinated eucalyptol without heating. When solution is complete, add 8 c.cm. of the chlorinated paraffin oil. Mix well, and the solution is ready for use. This solution contains 2 per cent. of the dichloramine-T. It is relatively unstable, and should be discarded as inefficient as soon as a distinct precipitate makes its appearance (toluene-para-sulphonamide). An opalescence or moderate cloudiness is not evidence of material deterioration. It is a safe rule not to use the completed oil mixture more than three or four days after its preparation. Strong light and heat undoubtedly hasten the rate of deterioration.

An alternate method, when considerable quantities are required, is to prepare a stock solution, 10 per cent. of the dichloramine-T in chlorinated eucalyptol, and to dilute this with chlorinated paraffin oil, 1 : 4, as needed for immediate use. The eucalyptol solution should be kept in a cool, dark place, and under these conditions will suffer little deterioration within a month.

REFERENCES.

[1] Lieutenant-Colonel M. H. Gordon: Disinfection of the Nasopharynx of Meningococcus Carriers, BRITISH MEDICAL JOURNAL, July 1st, 1916. Also a later article by the same author and Captain Martin Flack, published in the same JOURNAL. [2] H. D. Dakin, J. B. Cohen, and J. Kenyon: On Chloramine, its Preparation, Properties, and Use, BRITISH MEDICAL JOURNAL, January 29th, 1916. [3] *Trans. Chem. Soc.*, 1905, vol. lxxxvii, p. 145.

CLINICAL NOTES ON A CASE OF FIBROID DISEASE OF BURSAE.

BY

CAPTAIN MANFRED MORRIS, R.A.M.C.(T.F.).

FIBROID HYPERPLASIA occurring in bursae and false bursae is of interest rather from the point of view of etiology than of treatment. My attention was lately drawn to this condition by a case of widespread fibrosis occurring in many bursal sites.

In January last there was admitted to the Surgical Division of No. — General Hospital a patient, aged 53, an engine-room artificer in the Royal Navy. He complained of piles and inability to sit down owing to the pain caused by tumours in his buttocks. On examination the patient had four external haemorrhoids and large solid masses over the tuberosities of both ischia. These masses were as large as fetal heads, the right one being somewhat larger than the left. The tumours were irregular in outline, adherent to skin, and felt fixed to deeper structures.

On palpation they gave a non-fluctuant, hard, almost cartilaginous sensation to the hand. The skin over these masses was red, tender, and beginning to be inflamed. Further examination of this patient showed smaller tumours of similar consistence and physical signs occupying situations over the olecrana, the tubercles of both tibiae, the third piece of the sacrum, and one small mass as large as a walnut on the ulnar aspect of the base of the left thumb. The patient complained chiefly about his piles, and at a preliminary operation I ligated these. Convalescence was normal, the patient being encouraged to lie in the prone posture as much as possible to give the skin over the buttocks a chance to recover. Fourteen days later I decided to operate on the masses in the buttocks. The disability caused by these was purely mechanical. *X*-ray examination showed no bony changes in the pelvis and hip-joints. The tumours were represented by dim shadows mapping out their outline, which appeared to be continuous with the tuberosities of the ischia. The patient was placed in the prone position, with sandbags across the sterno-clavicular articulation and pelvis, so as not to embarrass respiration, and given chloroform. Curved incisions were made over the masses, which were found to be extremely dense and adherent. Their capsule was very vascular, and adherent to surrounding tissues. It was soon obvious that it was impossible to shell out these tumours, so they were removed by morcellement, triangular wedges being cut out till the masses

were removed. The tumours extended down to, and, as far as one could judge, were continuous with the periosteum over the tuberosities of the ischia along their whole length. The ensuing large cavities were flushed out with hot saline and obliterated with buried catgut sutures, the wounds being closed with interrupted silkworm gut. The smaller tumour over the sacrum was enucleated without any difficulty. The patient made an uninterrupted recovery, and was discharged to a convalescent home. He states that he lately sat down at a concert on a hard form for one and a half hours—a thing he has been unable to do for thirty years.

To the naked eye the masses appeared fibrous and avascular throughout. There was no obvious lamination or cavity in the tumours, which appeared to derive their blood supply from their capsules. It appeared remarkable that masses of such size and such a poor blood supply could survive without undergoing some obvious degenerative changes. Captain Campbell kindly examined these specimens for me, and reported that the tumours were typical fibromata. There has thus to be considered a case of widespread fibrous changes occurring in bursae in normal positions and a fibroma occupying a situation not as a rule where one finds a normal bursa—I refer to the tumour of the left thumb.

The commonest changes in bursae set up by chronic irritation causing inflammation are seen in the bursitis of the occupation diseases known as housemaid's knee, miner's elbow, and weaver's bottom. These conditions are respectively an inflammation of the bursae in the prepatellar, olecranon, and ischial tuberosity situations. The condition starts as a hydrops. The bursae, irritated by prolonged pressure, secrete an excess of synovial fluid, Nature's method of forming a more efficient water cushion. Secondary infection, haemorrhage, deposition of fibrin substance, and thickening of the wall of the bursa may ensue.

The tumours in this case are unlike this condition. The youngest tumour is the small one in the thumb and the one removed from the sacrum; neither of these appears to have started as a hydrops or a haemorrhage. It is therefore unlikely that the larger ones started as either of these two conditions, afterwards undergoing solidification. The patient's occupation is not one that, so far as can be seen, is likely to give rise to bursitis. He has been at sea working in engine-rooms for thirty years, and apart from some cramping, does not do very sedentary work or work that throws prolonged strain on the situations involved. It appears, therefore, that the theory that the patient's occupation caused this condition can be dismissed.

The question now arises if this condition may be due to tubercle, syphilis, or gonorrhoea. Tubercle can be immediately dismissed. It is impossible to imagine chronic masses of this size without the presence of caseation or giant cell formation. In discussing the probable venereal origin of this condition we must go back to 1887. In August of that year the patient developed a "running" which ceased after three weeks. He denies chancre, sore throats, rash, or other syphilitic manifestations. Almost immediately after cessation of this urethritis he was admitted to hospital in Bombay with what he describes as rheumatic fever, and states that he was in hospital till January, 1888. He has suffered from rheumatic pains since, but has never been in hospital again with them. Twelve months after the illness he noticed that lumps were beginning to grow over the buttocks and elbows. At first as large as peas, they gradually and insidiously grew, till at the end of thirty years they have reached their present size. His only previous illness was typhoid fever in 1883, in Constantinople. The tumours have caused no pain or trouble, apart from those of the buttocks, which have prevented the patient from sitting down. Captain Mackey reports that the patient has a strongly positive Wassermann reaction. Must we look upon the fibroid changes in these bursae as being of a syphilitic or gonorrhoeal origin?

In thirty years the only syphilitic changes are these large deposits of fibrous tissue, without, as far as can be found, there having been any other syphilitic or gummatous manifestations taking place. Gonorrhoea certainly produces inflammation of synovial membrane, and therefore could produce a bursitis. I think it unlikely that it could produce the condition we are considering.

Taking into consideration the histology of these masses—the fact that one of them has probably occurred in tissue other than synovial membrane—it seems probable, as Erichsen points out, that we have to consider a case in which the tissues have developed a tendency to undergo fibrous hyperplasia, the changes taking place chiefly in the synovial walls of bursae. Admitting the syphilitic taint and the gonorrhoeal history, the rheumatic pains similar to the pain felt in nodes, I look upon these masses as primary non-malignant growths of fibrous tissue.

BRONCHOSCOPY IN THE TREATMENT OF ASTHMA.

By W. S. SYME, M.D., F.R.S.E.,

SURGEON, EAR, NOSE, AND THROAT HOSPITAL, GLASGOW; EXTRA-ACADEMICAL LECTURER ON DISEASES OF THE THROAT AND NOSE, GLASGOW.

Among the patients who come under the care of those engaged in the special branch of rhinology and laryngology there are always a certain number who complain of asthmatic attacks of a more or less definite character. In most of these patients the asthma is not severe, and is rather of the nature of difficulty of breathing caused by nasal obstruction, or at any rate of an interference by this obstruction with the co-ordinated movements of which regular respiration is composed. There are others in which asthma, and sometimes severe asthma, is associated with a nasal affection of which obstruction is not a prominent feature. In accessory sinus disease, and especially in maxillary antral disease, asthma is not infrequently complained of. The cure of the sinus disease is, as a rule, followed by disappearance of, or at any rate by marked alleviation of, the asthmatic attacks. The relation of the sinus disease to the asthma is probably complex, and depends on the intermittent obstruction which the discharge from the sinus causes, the irritation of the discharge on the upper air passages, and possibly the action of the products of suppuration on the higher nerve centres.

In speaking of asthma one of course recognizes that it is not a disease but a symptom, and that for its proper study an inquiry into practically all the organs of the body would be necessary. Even in what is known as pure spasmodic asthma the problem is not simple. The respiratory apparatus is not alone at fault. There is also a susceptible condition of the central nervous system which in the present state of our knowledge cannot be more definitely described. It is evident, therefore, that in the proper treatment of asthma there is room for the co-operation of the specialist and the physician. Treatment applied to the air passages alone has, then, limitations and is empirical.

Not every case of asthma associated with a nasal or sinus affection is cured or even appreciably benefited by the effective treatment of the nasal or sinus condition. Moreover, in many cases there is no nasal abnormality, if one may say so, though it has been cynically said, "It's a poor nose a nasal surgeon can't find something wrong with." The nasal treatment of asthma, or in other words the treatment by cauterization of the nasal septum, has in my experience given only temporary benefit.

During the past two years I have treated eight cases of asthma by the direct application of silver nitrate solution to the lining of the bronchi with the aid of the bronchoscope. The ages of the patients ranged from 10 to 53. Except in the youngest, in whom chloroform was used, the treatment was conducted under cocaine anaesthesia with a preliminary hypodermic injection of omnopon or morphine and atropine. The position of the patient was that which I prefer for bronchoscopy—lying on the left side with the head thrown back. The bronchoscope is introduced, and a mixture of cocaine and adrenalin is applied to the mucous membrane in advance of the tube as far as the openings of the secondary bronchi. The entrance to the secondary bronchi and the main bronchi are then swabbed with a 10 per cent. solution of silver nitrate. I have been specially careful to apply the solution to the regions of the bifurcations, because it seemed to me that the mucous membrane at these places was hyperaemic, and, at any rate, one would expect the air current to impinge most strongly at these points, and the reflex to be most active there. The idea underlying the treatment is that in asthma one factor in the causation is an exaggeration of a normal reflex. When an irritative substance, such as an irritating gas, touches the lining of the bronchi and larger branches, the smaller bronchi and bronchioles are by reflex action contracted for protective purposes. In attempting to weaken this reflex in asthma by applications to the peripheral pole, it is not implied

that the hypersensitiveness is at that part. Probably it is, as has been previously observed, central in the main. Silver nitrate solution suggested itself because it is commonly used in irritative conditions of the higher parts of the respiratory apparatus, and because it leaves a coating of silver chloride or albuminate, and so its action is prolonged.

A fairly acute reaction follows the application, as would be expected, and the breathing is somewhat laboured for a day or two, during which the patient is kept in bed.

From the short notes of the cases treated, which are appended, it will be seen that the method is worthy of an extended trial. Indeed in several of the cases, and those severe, the results have been surprisingly good—quite, I am bound to say, beyond my expectation.

CASE I.

Male, aged 44. Severe spasmodic asthma of many years' duration. Has had various forms of treatment, including residence abroad, but without benefit. Lately the attacks have been more frequent and very severe, occurring every night and often requiring morphine. He came under my care two years ago. He was then treated by the method described and the treatment was repeated on four occasions, the last being over ten months ago. At that time he reported that he had not had such a good year for years. Now he reports that he has been practically free from asthma for the past year. He is busily engaged in Government work, and once he had to pass through a workshop where there were gas fumes, and, as a result, he had a slight attack of asthma, which is the only one he has had in the period. His general appearance reflects the improvement in his asthma.

CASE II.

Male, aged 53. Frequent asthmatic attacks, especially in frosty weather. He was treated on one occasion eighteen months ago. The interesting point in his case was the discovery of a web formation in the shape of a firm band at the entrance to the right bronchus. He reports that his asthma has not benefited.

CASE III.

Male, aged 10. Bronchial asthma. This boy had severe bronchial asthma for several years. There was no nasal or nasopharyngeal abnormal condition. Treated under chloroform more than a year ago. The mucous membrane of the bronchi, especially of the left, was oedematous. There was trouble with the anaesthetic and the applications of the silver nitrate were not so systematically carried out. For some time afterwards the breathing was better and he had no definite asthmatic attack, but now the asthma has returned. His father was advised to bring him back to have the treatment repeated, but has failed to do so.

CASE IV.

Male, aged 35. This man, a railway employee, had suffered from severe spasmodic asthma for years. He had been treated in various ways, by nasal cauterization among others, but without benefit. Latterly he had become so much worse that he was rendered unfit for work for about a week every month and was in danger of losing his post. More than a year ago he was treated by this method, the applications being made on two occasions with an interval of a week. He reports that with the exception of one attack, which kept him away from work for a day, he has been quite free from asthma. He certainly looks much improved in health.

CASE V.

Female, aged 24. First seen August 18th, 1916. During the previous four months she had had an attack of severe spasmodic asthma every fortnight. Treated September 15th. She reports that she has been quite free from asthma since.

CASE VI.

Female, aged 53. Bronchial asthma of some years' duration. Successfully operated on for right maxillary antral disease, but without benefit to the asthma. Treated September 15th. This was followed by a somewhat prolonged, though not severe, bronchial attack. She reports that she has been free from asthma for months.

CASE VII.

Female, aged 24. Spasmodic asthma and paroxysmal sneezing for two or three years. Four severe asthmatic attacks recently, lasting for some hours. Treated September 19th. A small warty growth was seen on the wall of the left bronchus low down. She reports that she has had several asthmatic attacks during the winter, but for the past two months has been free.

CASE VIII.

Female, aged 18. Has suffered from severe spasmodic asthma since four years of age. Latterly the attacks recurred about every second week and left her unfit for work for a day or two. Her tonsils, which were enlarged, were enucleated without benefit to the asthma. Treated by the application of silver nitrate with the aid of the bronchoscope on January 19th, 1917. She reports that she has been quite free from asthma since and quite well in health.

A NEW CULTURE MEDIUM FOR THE GONOCOCCUS.

(Preliminary Note.)

BY CAPTAIN D. THOMSON, R.A.M.C., M.B., CH.B.EDIN., D.P.H.CANTAB.

THE following work was carried out in the laboratory of the Military Hospital, Rochester Row, London, S.W., under Lieut.-Colonel L. W. Harrison, D.S.O., R.A.M.C., and I wish to express here my keen appreciation of his encouragement and help.

There has been a great need recently for a satisfactory culture medium for the gonococcus, not only for diagnostic purposes, but also for the manufacture of gonococcal vaccines. The media chiefly employed so far, namely, trypsinized pea extract and blood agar, have the following defects:

1. The growth is by no means profuse.
2. The medium is not clear and transparent, the trypsinized pea extract being yellowish and opaque, and the blood agar opaque and dark red. The whitish and translucent gonococcus growth is not seen clearly on such media.
3. For vaccine purposes blood agar is very unsatisfactory because the water of condensation at the bottom of the tube contains a dark brown débris of broken-down red cells. The gonococcus emulsion mixed with this water of condensation is in consequence coloured and full of débris, which renders it difficult to standardize.
4. The emulsion obtained from the trypsinized pea extract cultures, though yellow in colour, is quite satisfactory from this point of view. This culture medium, however, does not appeal to me as a natural one, and it is possible that after frequent subculture the gonococcus may lose its antigenic properties and become less potent for vaccine purposes. At any rate, it seems reasonable to suppose that the best medium would be one which was as natural as possible.

My first attempt was to remove the great disadvantage of the blood agar (a natural medium) by using human blood *minus* the red corpuscles—that is, plasma. It was found that the gonococci grew as well on plasma agar in the proportion of 1 of plasma to 4 of agar as they did when the corpuscles were present.

The growth, however, was, as in the case of the blood agar medium, not profuse, but after some further experiments very strong growths were obtained with a similar medium made up as follows:

1. Prepare nutrient agar (2.5 per cent.) in the ordinary way with bouillon and Witte's peptone (1 per cent.), and render it + 6 acid.
2. Instead of adding to this 0.5 per cent. sodium chloride as is usual, add all the salts natural to the human blood (as in Ringer's solution)—namely: Sodium chloride 9 grams, calcium chloride 0.25 gram, and potassium chloride 0.42 gram per litre.
3. Add glucose 2.5 per cent. This addition in some manner renders the growth much more profuse.
4. The nutrient agar with salts and glucose is then tubed, about 4 c.cm. being added to each test tube.
5. The sterile tubed agar is melted in boiling water, and after allowing it to cool to about 50° C., add 1 c.cm. of human plasma to each tube and mix thoroughly by rolling the tube between the palms. Allow the medium to solidify in a sloping position.

For plating, the contents of three tubes may be added to a Petri dish.

Method of Obtaining Human Plasma.

In all venereal hospitals blood is frequently drawn off from the veins of syphilitic* patients into test tubes for the Wassermann test. In consequence, the source of human plasma is always available.

When a supply of plasma is required, draw off three-quarters of a test-tube-full of blood with all sterile precautions. Have a sterile centrifugal tube ready, containing 2 c.cm. of a 2 per cent. solution on sodium citrate. Fill up this centrifugal tube with the freshly drawn blood. Plug it with a sterile cork (keep the corks in alcohol and burn off the alcohol before plugging) and centrifugalize. When the corpuscles are driven down, pipette off the supernatant plasma with a sterile 10 c.cm. pipette and add 1 c.cm. to each tube of agar as indicated above. If the test tube of blood is three-quarters full there is sufficient left for the Wassermann test after filling the centrifugal tube.†

The medium is therefore as easy to prepare as the blood agar itself, and it is certainly less trouble to make than the trypsinized pea extract. It has none of the disadvantages mentioned above. It is beautifully clear and transparent,

* It is immaterial whether the patient is being treated or not with arsenic or mercury.

† I usually get 6 to 7 c.cm. of plasma from each centrifugal tube.

and it is as natural as possible. The growth is very profuse, even after eighteen hours, and the emulsion obtained is white.

When counting a vaccine, a culture not more than one day old should be used, since after this time many of the gonococci begin to autolyze, and the count would be too low. After making up standard emulsions of, say, 1,000 and 500 million gonococci per c.cm., the strength of other emulsions can be estimated directly by diluting and matching them with the standard.

I hope to publish later results showing the antigenic power of vaccine prepared on this medium.

A NOTE ON THE VALUE OF BRILLIANT GREEN AS AN ANTISEPTIC.

BY

CAPTAIN C. H. S. WEBB, M.S., F.R.C.S., R.A.M.C.

THE comparative novelty of the use of brilliant green as an antiseptic for the dressing of wounds is the excuse I submit for the following notes.* Since May, 1916, I have been using and observing the effects of a solution of brilliant green in the treatment of wounds that have passed through my hands at a casualty clearing station. On the whole, I am favourably impressed with the good results obtained from its use.

The brilliant green is dissolved in normal saline solution in the strength of 1 in 1,000. At this strength it can be used as a lotion, and gauze soaked in it can be applied to the wound as a dressing. It is non-irritant to the tissues, and I have applied it to the peritoneum, the meninges, the synovial membranes, and practically all other varieties of tissue without harmful effects. The less vascular tissues are stained green by its use—for instance, the cuticle of the skin, the edges of fascia or aponeurosis, and sometimes bone. But where it has been in contact with the more vascular muscle or subcutaneous tissue no staining occurs. Dead and necrosed portions of muscle are stained green, and this fact is sometimes of use in distinguishing such necrotic tissue.

After being in contact with the tissue, the dye gradually becomes transformed into a leuco-derivative, and the hitherto green-dyed gauze in contact with the wound becomes white to the depth of several layers. Granulation tissue rapidly forms in the wound, and to emphasize this statement I believe that the formation of granulation tissue is more rapid and more "virile" in character under the influence of a dressing of brilliant green than with other antiseptics—for example, eusol.

The most striking results are seen in the cut surfaces of muscle. The muscle rapidly becomes bright red, and the formation of a highly vascular granulation tissue takes place. In thirty-six to forty-eight hours the muscle may be covered with firm, "dry," bright red granulation points, which present none of the shreddy, sodden look of the granulations under a eusol dressing. The surface of the wound is drier, and the pus formation is smaller in amount and thicker in consistency, than in a similar wound dressed with eusol.

At a casualty clearing station it is almost impossible to formulate other than approximate conclusions concerning the merits or demerits of any antiseptic. The obstacles against obtaining any exact judgement are as follows:

1. The cases have been handled before, and other antiseptics have been applied—that is, at the field ambulance.

2. The cases do not stay long enough for any extended observation, before being transferred to the base.

3. Those cases that do stay and on which more lengthy observations can be carried out, are of the more severe type, many having mortal wounds.

4. The difficulty of obtaining news of the subsequent history of the case after it has left the casualty clearing station.

However, by a method of comparison of selected cases, as nearly as possible similar in nature and extent of injury, it is possible to estimate the relative merits of two or more antiseptics, as judged by clinical standards. By such means I have tried to compare brilliant green with eusol, and I believe that the green is the better antiseptic of the two.

Latterly I have been using the green in conjunction with "salt" tablets. It has been my experience that the usefulness of the "saline pack" is enhanced by the inclusion of some antiseptic in the dressing. The combination of the "saline pack" with the green solution during the first few days of the wound has, I think, given better results than the use of one or other alone. It can also be used after the method of Carrel—½ oz. to 1 oz. of a 1 in 1,000 solution being syringed down a tube or series of tubes leading into the depths of the wound. It is not so irritant to the skin edges as the hypochlorite solution.

SUMMARY.

1. Brilliant green is undoubtedly an active and efficient antiseptic.
2. It is non-irritant.
3. It acts well in the presence of serum.
4. It possesses very definite "auxetic" properties.
5. It stains dead tissue green, and in this way may aid the surgeon in determining what to excise.
6. As it is soluble in "saline" it can be used in conjunction with the "salt pack."
7. It can be used after the method of Carrel.

FLIES AND BACILLARY ENTERITIS.

BY

WILLIAM NICOLL, M.A., D.Sc., M.D., D.P.H.,

LATE ERNEST HART MEMORIAL SCHOLAR OF THE BRITISH MEDICAL ASSOCIATION, AND GROCERS' COMPANY RESEARCH FELLOW IN SANITARY SCIENCE.

(From the Lister Institute of Preventive Medicine, London.)

IN view of the rapidly approaching summer campaign, it seems advisable to draw attention again to the ever-present dangers from flies during the "season." So much has been written on the subject that it might seem almost invidious to direct attention again to our commonest and most familiar domestic pest.

The matter has received thorough treatment by the Local Government Board, and has been taken up to some extent by independent observers. By far the most comprehensive series of observations is that by Graham Smith,[1] extending over a number of years. In his *Flies and Disease* we have the nucleus around which to group further incidental observations and theories.

The limit of the house-fly's potentialities as a disease carrier has not yet been ascertained, and it might with some degree of safety be affirmed that the spread of almost every disease with which is associated an infectious discharge or exudation of one sort or another may be furthered and accelerated by house-flies. Such diseases are common, and not a few of them are well known to reach their maximum incidence at or about the height of the fly season. On the other hand, in no case has the house-fly been definitely proved to be the exclusively specific carrier of any particular disease. In the majority of cases it is merely the most assiduous and most effective. So far as I am aware, the house-fly is not in any case the actual "intermediate host" of any disease-producing organism occurring in man. It appears, however, to be a true intermediate host of at least one parasite of the horse (*Habronema muscae*).

During the course of my tenure of the Ernest Hart Fellowship, I was able to show[3] that flies had considerable potentialities as disseminators of parasitic worms, and I was led to make investigations on the bacterial flora associated with flies, and in particular on the occurrence of certain organisms pathogenic to man.

In a recent paper (1917) I published the results of a series of experimental investigations on the relation of

* The potent antiseptic properties of brilliant green were drawn attention to by Browning and Gilmour (*Journ. Path. and Bact.*, vol. xviii, 1913, p. 144), and this substance was first employed as an antiseptic in the treatment of wounds by Leitch (BRITISH MEDICAL JOURNAL, February 12th, 1916); its action under clinical conditions has also been very favourably reported on by Ligat (BRITISH MEDICAL JOURNAL, January 20th, 1917), and Hodgson-Jones (BRITISH MEDICAL JOURNAL, 1917, i, p. 455) has recorded excellent results in the rapid healing of indolent ulcers under the use of an ointment of 1 to 2 per cent. brilliant green in paraffin. Further investigations by Browning, Gulbransen, Kennaway, and Thornton (BRITISH MEDICAL JOURNAL, January 20th, 1917) have shown that concentrations of brilliant green which are highly bactericidal for organisms, such as staphylococci, in the presence of serum, do not interfere with the process of phagocytosis; in this respect brilliant green is much superior to mercury perchloride.

flies to the spread of typhoid fever. Some years previously (1911) I published the results of a general investigation of the natural bacterial flora of the house-fly (*Musca domestica*), and noted the occurrence of certain enteritis-producing bacteria such as Morgan's No. 1 bacillus and *B. paratyphosus* B. The flies from which these bacilli were obtained, captured in houses in Battersea, London, were not allowed access subsequently to any possible source of infection, so that there can be no question that they were actually carrying these bacilli when captured.

The first paper was published as a preliminary report before the investigation was completed. During the following summer further observations were made along similar lines, and about 2,000 flies were collected from houses where cases of diarrhoea or dysentery, either in children or adults, were actually present and had recently occurred. The houses were designated by Dr. G. Quin Lennane, M.O.H. Battersea, and in each a recently sterilized balloon trap was left usually for two days, sometimes for only twenty-four hours, and occasionally for three days. During transit each cage was kept as free from contamination as possible. There can be little doubt that while the cages remained in the houses in which they were deposited they were the object of some curiosity and probably considerable handling, but this does not invalidate the results obtained from the later examination of the contents of the cages.

In the laboratory the flies were removed from the cages by sterilized muslin bags. A simpler but somewhat slower method was to place the cage under a large bell jar into which a little chloroform had previously been poured. The flies were sorted into batches of about half a dozen, and each batch was thoroughly washed first in peptone broth, and then in saline, followed by immersion for twenty to thirty minutes in lysol or other disinfectant. They were then washed free from the disinfectant with sterile water, and dried by passing over a flame, and dissected; the entire alimentary canal was removed, and placed in a few drops of sterile peptone broth and thoroughly mashed up. A small loopful of this emulsion was then spread on three successive MacConkey plates (neutral red bile-salt agar), and incubated at 37° C. for about twenty-four hours. From each plate all the non-lactose fermenting colonies were removed, and inoculated separately into peptone broth.

In dealing systematically with the results, the table drawn up by Morgan and Ledingham[2] was used with slight modifications (suggested by the authors themselves). One of the chief difficulties encountered was the occurrence of slow lactose fermenters. In every case, however, the action on lactose was observed over a period of at least ten days, and such cultures as gave equivocal reactions were subcultured and re-examined. A certain proportion of these slow lactose fermenters which gave reactions somewhat resembling those of the typhoid-dysentery group are excluded from the present results.

On the other hand, there is the difficulty that certain strains of bacteria may be "trained" or "acclimatized," and, though at first unable to ferment lactose, may do so in the course of time, or after repeated subinoculation. Throughout the whole course of these experiments I had the advice of Dr. W. J. Penfold, who was at that time engaged in the special study of bacterial variation. A certain proportion of these equivocal strains were submitted to him for independent examination. In addition to those slow lactose fermenting bacilli a considerable number of true non-lactose fermenters occurred. They were subdivided into two classes, according as their reactions showed affinity with those of the typhoid-dysentery group or not.

Altogether 216 separate forms were isolated. Of these 89 were representatives of Graham Smith's Group C; 40 belonged to Group H; 34 to Group G; 20 to Group A; 13 to each of Groups B and I, and 7 to Group D. Groups E, F, J, K were entirely unrepresented.

These results accord fairly closely with Graham Smith's, who found a large preponderance of organisms of the type of Group C, while those of Groups H, G, and B were relatively much less frequent. As in my experience, Groups E, F, J, and K were entirely unrepresented, while Groups A and D occurred rarely, and Group I not at all.

In analysing the various groups some difficulty was experienced in following Graham Smith's classification, because in several cases salicin was not available. With this exception the results obtained are closely comparable with those of Graham Smith.

In Group A the organisms found were Nos. 1, 5, and 6. No. 6 was that most frequently found in flies by Smith, while it was also found most frequently in the faeces of diarrhoea cases. Nos. 1 and 5 are the most common types in normal children. In Group B all the varieties belonged to Subgroup B *a*, and the most commonly occurring members were Nos. 7 and 8, the latter being those most frequently associated with diarrhoea cases.

Group C is one of the largest and most important, and its representatives were by far the commonest in my experience. The most frequent types were C *a* and C *g*, 7 and 8; C *a* 8 and C *g* 8 were those most commonly found by Graham Smith, and this has been the experience of several other investigators. In my experience C *a* and C *g*, 11 and 12 were fairly common. Other types were extremely uncommon. Nos. 2, 3, 4, 5, 6, 10 were not encountered in any of the groups or subgroups. This is in accord with Graham Smith's findings, apart from the fact that he found C *g*, 5 and 6 fairly commonly.

Group D is exceedingly uncommon, and only a single representative—namely, D *d* 17—was found. It has been found only once in flies, and exceedingly rarely in children. In Group G, type G *a* 8 was twice as common as any other. Nos. 6, 9 and 12 were the only others met with. In Group H, which contains a considerable number of relatively infrequent types, half a dozen different varieties were encountered, for the most part referable to the Subgroups *a* and *g*. Finally, in I the varieties isolated were—*a* 10 and *c* 10.

From this short summary it may be judged that these results, while much less extensive and comprehensive than those of Graham Smith, follow his fairly closely. They serve to show, in the first place, that the non-lactose-fermenting bacterial flora of the fly's intestine is, within a certain range, fairly distinctive, and moreover, that in flies captured in dysentery or diarrhoea areas the bacterial flora is considerably altered in character, the forms found tending to approximate to certain more or less definite types, which appear to be associated with the disease in children—or rather, perhaps, with the conditions which accompany or give rise to the disease.

Of the bacteria which have been specifically identified with the disease, none is better known, probably, than Morgan's No. 1 bacillus (G *a*). Whether this be the actual causal organism or not, there can be little question that it is a fairly common inhabitant of the intestine of flies, particularly during the summer months.

The occurrence of *B. paratyphosus* B in flies in the natural state is of considerable importance. It may be, however, that, as appears to be the case with *B. typhosus*, it is only a fortuitous inhabitant of the fly, and that in ordinary circumstances it is more or less rapidly eliminated.

The chief point to be determined in regard to the relation of flies to enteric diseases appears to be whether the pathogenic bacteria ingested by flies are eventually excreted without appreciable loss of virulence. It has been shown that in the case of *B. typhosus* the bacilli may be excreted by the fly for a short time, and that such bacilli may retain their serological properties and characters to such degree as to render them indistinguishable from virulent organisms of the same kind. It is, however, hardly to be expected that the short sojourn of, it may be, forty-eight or twenty-four hours or less in the fly's intestine can have much effect upon the pathogenic properties of the bacteria. Were it otherwise, one might at least expect some change, even though slight, in their biological properties. This matter, nevertheless, appears to be worth some further investigation.

Conclusions.

It has been fairly conclusively proved:

That under experimental conditions flies can readily carry and disseminate certain pathogenic organisms.

That these organisms are not infrequently met with in flies under natural conditions, particularly in association with outbreaks of infectious diseases.

That organisms producing bacillary enteritis are to be met with not infrequently in flies under natural conditions.

That a considerable number of organisms resembling

enteritis bacilli occur frequently in flies in the natural state, and that the utmost care is necessary in discriminating between these and the true enteritis-producing organisms.

References.

[1] G. S. Graham Smith (1913): *Flies and Disease: Non-bloodsucking Flies*, Cambridge University Press. [2] H. de R. Morgan and J. C. G. Ledingham (1909): The Bacteriology of Summer Diarrhoea, *Proc. Roy. Soc. Med.*, II (Epidemiological Section), pp. 133-158. [3] W. Nicoll (1911): On the Part played by Flies in the Dispersal of the Eggs of Parasitic Worms, Reports to the Local Government Board on Public Health and Medical Subjects, N.S., No. 53, pp. 13-30. [4] W. Nicoll (1912): On the Varieties of *Bacillus coli* associated with the House-fly (*Musca domestica*), *Journ. of Hygiene*, xi, pp. 381-9. [5] W. Nicoll (1917): Flies and Typhoid, *Journ. of Hygiene*, xv, pp. 505-525. [6] R. A. O'Brien (1911): Report on an Investigation of the Bacterial Content of the Faeces of Young Children, Fortieth Annual Report Local Government Board for 1910-11, App. B., pp. 367-373.

The Croonian Lectures
on
ADAPTATION AND DISEASE.

Delivered at the Royal College of Physicians, June 21st, 1917.

By J. G. ADAMI, M.D., F.R.S.,
Lieut.-Colonel C.A.M.C.

LECTURE III.

Adaptation to Disease-producing Agencies in the Higher Animals.

(*Abstract.*)

From the data brought forward thus far the following conclusions can reasonably be drawn:

1. The evidence is abundant and conclusive that bacteria are capable of being modified by alterations of environment of certain orders.
2. The modifications conform with Herbert Spencer's "direct adaptations."
3. It can be shown that not some, but all, the microbes subjected to particular orders of alteration of environment exhibit the particular modifications: the hypothesis of "chance variation" in one direction with survival of the fittest is incapable of explaining the phenomena.

After calling attention to two examples of direct adaptation in protozoa higher than the bacteria, namely, the conversion of negative into positive chemiotaxis in the myxomycete, Fuligo, and Musgrave and Clegg's observations upon the accustomance of entamoebae from the intestine to new bacterial and tissue foodstuffs, it was pointed out that the overwhelming studies of the last quarter of a century upon immunity afford the deepest insight into the processes involved in direct adaptation in the higher animals. There is a vast literature upon the subject. Some of the most notable achievements in science of our generation have been in this particular province. The names of Pasteur, Koch, Ehrlich, Metchnikoff, Almroth Wright, are household words. Every intelligent being knows something about tuberculin, diphtheria antitoxin, phagocytosis, and typhoid inoculation. Yet no single general biologist has dealt seriously with the significance of these discoveries in relationship to adaptation and evolution.

Typical examples were afforded demonstrating that immunization of the individual is direct adaptation. The cases of the phytotoxins, abrin and ricin, were considered in the first place. Both are intensely poisonous in minute doses. Against both the animals of the laboratory can be immunized so that they can withstand 500 or 5,000 times the lethal dose; the blood serum of the immunized animals contains bodies which neutralize the toxin. Evidence was given showing that the cells of the body of the immunized animals elaborate and discharge the antitoxin in great excess over the amount of toxin originally introduced; that they continue to elaborate this for weeks and months after the introduction of the toxin. We deal with the acquirement of a new property which cannot possibly be regarded as the calling into activity of a property previously possessed; the acquirement is something positive; there can be no alternative hypothesis of loss of inhibiting factors; no possibility of ascribing the new property to the persistence of a chance variation. Antiricin can be produced in rabbit or mouse with absolute certainty, and there is here no alternative explanation of the survival of the fittest.

The parallel examples of the production of diphtheria and tetanus antitoxins were then taken up, and next it was shown that the cells which absorb and fix the toxins produce the antitoxins. Following this, the more widespread bacteriolytic immunity developed against members of the typhoid-coli group, cholera spirilla, micrococci, etc., was studied and shown to be an acquired power of digestion of unfamiliar proteins, especial reference being made to Pfeiffer's reaction. Nor is the acquirement of necessity temporary in the individual. It may last for months and even years. Reference was made to the agglutinating powers of the blood of those recovered from typhoid fever months and sometimes years after complete convalescence.

This continued production exemplifies what Weigert and Fraser Harris had referred to as the "law of inertia." In the order of events here discussed the lecturer held that the activity once started continued too long to be comparable with physical inertia or momentum; there seemed to be the setting in motion of a serial or cyclic series of intercellular reactions and counter-actions, the one action starting the other. He preferred, therefore, to employ for the present the non-committal term of "the law of habit."

Numerous examples were given of the working of this law of habit in association with morbid states of various orders in man, of the survival of symptoms long after the agent causing the symptoms had disappeared, particular reference being made to the tics, hysterical and neurotic manifestations; the continued production of antitoxins and bacteriolysins was of the same order; he held that this same law explained the metaplasias and neoplasias.

As to the *inheritance* of these acquired conditions in the higher animals, he pointed out the restrictions induced by conjugation and amphimixis, the difficulties introduced in mammals by the intrauterine existence of the fetus, and in man by social customs. Two conditions have to be taken into account—namely, those of indirect and direct (or identical) inheritance.

Regarding indirect inheritance, it has to be observed that the germ cells are not so sacrosanct as to be insusceptible to influences affecting the body at large. The germ cells have to absorb foods and grow. If the lymph contain soluble substances the germ cells are not precluded from absorbing and being affected by them. And that this does occur is well shown by the studies upon the effects of paternal intoxication with lead, mercury nitrate, products of the tubercle bacillus, abrin, etc., the mother not being exposed to the poisons. In all these cases reduction in the number of pregnancies is noted, with increase in the number of stillbirths, liability to death within a few days after birth, and the production of an impoverished and highly susceptible offspring, but a small proportion of the progeny reaching maturity. Lustig and Watson (with abrin), Carrière (with tuberculin) note, in addition, an increased susceptibility on the part of the offspring towards the specific poison.

Of all these observations the most clear and decisive are those of Professor Stockard, of Cornell University. He subjected male guinea-pigs daily for a period to the fumes of alcohol, and mating them with normal females obtained but five living litters from twenty-four matings, and of the twelve offspring, seven died in convulsions soon after birth; the survivors, when two months old, were half the size of control guinea-pigs of the same age. When now the nervous and undersized members of this second generation were mated, even when unrelated and never themselves exposed to alcohol, their offspring tended to be still more degenerate, and to show gross deformities. Mating together unrelated members of this third generation, in the few examples observed, gave even more unfavourable results. In other words, two alcoholized great-grandfathers influenced the progeny down to the fourth generation.

We have here the most precise evidence of the inheritance of acquired defects, evidence that fits in wholly with our routine medical experience of the danger of marriage in families which exhibit like nervous or other defects. With these experiments before us it is absurd to postulate that defects of these orders are atavistic, due to properties

which have been always possessed by some one or other strain introduced into the family. We must recognize that infection of one or other order, and intoxication, are capable of telling upon the parental germ plasm, and are capable of leading to the acquirement of conditions of defect. To us as medical men it is a minor point whether there is inheritance of the exact defect seen in the parent primarily subjected to the particular influence. At the same time it is not a little interesting that alcohol, lead, and bacterial toxins particularly affect the nervous system in the adult or adolescent, and that these acquired defects are peculiarly liable to influence the nervous system in the offspring.

"Parallel induction" of defects in body and germ cells have been noted of later years, and are being accepted, by an increasing number of zoologists and botanists interested in experimental embryology. The recent work of Kammerer upon *Salamandra maculosa* was cited in this connexion.

Instances of direct inheritance of acquirements are, and must be, rare and limited to cases in which the influences which, affecting the body cells, modify their internal secretions, and through these internal secretions so tell upon the germ cells and their metabolism as to set up similar defects and similar disorders of the internal secretions in the offspring. We know, as a matter of fact, that the endocrine organs as a class have a profound influence upon the generative organs and upon growth, and, from general experience, that metabolic disorders—gouty and "rheumatoid" states, defect and excess of internal secretions—are heritable. The results of medical research strongly support Darwin's earlier contention that congenital variation is to be attributed to the action or influence of changed conditions upon the parental body, and through it upon the reproductive germs. At the same time they indicate the existence of a limited group of cases in which the Lamarckian principle is exemplified, namely, that of identical inheritance of conditions acquired by the parent.

Thus at length, after long years of vague wanderings in the wilderness with not a little heavy fighting, we have, if mixed metaphors be permitted, conquered our Vimy Ridge, and although for a time held up, can indulge in a Pisgah view, and see when and how the next advance is to be made.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A CASE OF ENTEROSPASM.

I HAVE read with interest the article by C. H. Whiteford, in the JOURNAL of March 24th, entitled "A case of enterospasm in which the portion of intestine involved was of unusual extent." In the *Middlesex Hospital Journal* for October, 1916, I recorded a case of enterospasm in a boy of 18.

This patient was suddenly seized with acute pain in the epigastrium while at tea, and, on examination, I found him to be suffering from profound shock, with a pulse rate of 120, temperature 99°, and abdominal distension. A history of attacks of acute indigestion during the past two years was obtained. An examination of the abdomen revealed absence of liver dullness and immobility of the muscles of the anterior abdominal wall on respiration. There had been no vomiting. As it was considered possible that some abdominal catastrophe had taken place, it was decided to perform an exploratory operation without delay. On opening the abdomen in the middle line, immediately above the umbilicus, distended coils of intestine forced their way through the wound. An examination of the small gut showed that some portions were collapsed, simulating the condition found in the intestine distal to a mechanical obstruction, while other portions were dilated. No evidence of blockage of the lumen of the gut was discovered. The stomach was dilated, and the gall bladder distended to the size of a "William" pear. As the condition of the viscera was considered to be due to a functional lesion rather than an organic one, it was decided that further operative interference was inadvisable.

The day following the operation the patient commenced to vomit pure bile in large quantities. The vomiting lasted for twenty-four hours. The pulse-rate, previously maintained at over 100, decreased, and the abdominal distension gradually disappeared. Apart from considerable difficulty in getting the bowels to act, convalescence henceforth was uninterrupted.

Paresis of the duodenum probably accounted for the distension of the gall bladder and the biliary vomiting, following operation. It is possible that this vomiting might have been prevented had the gall bladder been aspirated.

As Dr. Whiteford points out in his article, these cases of enterospasm occur in neurotic subjects, but it is most likely that undigested and irritating foods, such as fruit seeds, may act as an exciting cause.

A. CLIFFORD MORSON,
Temporary Surgeon R.N.
H.M. Hospital Ship *Karapara*.

A METHOD OF PREPARING AND USING CATGUT.

IN this process the catgut is rolled, inserted in a tube containing the sterilizing solution, and the tube is closed so as to be air-tight. One lot of tubes are small, for ligation; the others about double the length, for suture. These tubes are controlled during operation by the surgeon, thus avoiding waste of time or material, as in the ordinary way of passage from attendant to surgeon, and the risk involved in such handling. The tubes are conveniently about 2 by 9 and 2 by 16 cm. long, with screw top, corks, and screw-on metal caps. The central part of the cap is removed, leaving just the peripheral portion. This arrangement prevents the corks coming out when the gut is drawn from the tubes. There are two suture tubes, one containing raw and the other chromic gut. The tubes are closed by cork or ether proof rubber stoppers.

The sterilizing solutions used for gut are ether, chloroform, absolute alcohol, or petrol. Any one of these is a powerful germicide and will render gut sterile in twenty-four hours. These have the great advantage, besides, of being volatile and therefore soon leave the catgut after withdrawal from the tube and before insertion of the gut into the tissues. Thus one or other of these substances satisfies a desideratum that I had been looking for in that it has the advantage of germicidal solutions (sterilization) without their serious disadvantage (retention in gut after removal with irritant action of contained chemical upon tissues). Another advance in the aseptic technique.

I have been using ether as the sterilizing solution of choice. This substance proves lethal to the ordinary pyogenic germs in a very short time, as I have demonstrated. All that is required to sterilize the gut is simply to insert it in ether and leave there indefinitely; it can safely be used after twenty-four hours, probably much sooner. In winding the gut reels are avoided, as they would take up too much space and render the glass tubes unnecessarily bulky to hold in the hand whilst working. The gut can be conveniently wound on a bandage roller. I use a nickel plated one with a thin rod carrying two circular discs to regulate any desired length of spindle; the spindle is to be long and thick enough to readily fit the tube. The end of the gut next the rod of the roller (that is, the commencing end) is left long, so that when the gut is drawn off the roller this end can be threaded through the cork by a straight needle, and the gut roll unwound from the core outward, the other end of the hank of gut ending on the outside of the spindle. This method of rolling takes up the minimum amount of space and enables the gut to be withdrawn readily. The ligature tubes contain one roll, the suture tubes about three rolls of different and convenient sizes. When the tubes are corked and the caps screwed on they are kept in an air-tight glass receptacle containing an antiseptic such as alcohol, petrol, etc., or an aqueous or spirituous solution of biniodide and sodium bicarbonate tablets, in which they remain immersed when not in use. For this purpose I use petrol, which is efficient and cheap, but its inflammable nature must not be forgotten. After using the tubes they are washed free of blood, etc., and replaced in the receptacle. The cap of the latter may be like those of the tubes (screw on). A container holding two long tubes and six small is convenient for carrying about, but larger ones would be required for hospital use. If non-volatile disinfectors are employed in the container the ordinary catgut jars may be used. The advantage of volatile solutions here also is that they evaporate, and therefore do not get on the hands to irritate the tissues.

As to the sterilization of the gut, the process is simplicity itself. Nothing else is required after rolling but

immersion in ether, or one of the other volatile solutions mentioned. In tying, the ligature tube is held in the surgeon's hand, which facilitates speed in tying and economy in the use of gut. The tube being sealed no blood or virus can get at the contents—an improvement which favourably contrasts with the crude metal cylinder with a longitudinal slit and a bulky reel. The suture tube can also be manipulated by the surgeon, which saves time, and it can be used as a tractor on the free end of the thread and to keep it out of the way after the first knot is tied.

It should be observed that the solutions mentioned in no way damage the catgut, so that its strength, thickness, and pliability remain the same; whilst the dryness of the gut after withdrawal from the tube is a great help in ligating.

With regard to the tubes, the ordinary one in which drainage tubing is sold is a very convenient size for the sutures, whilst tubes about half the length serve well to hold in the hand in ligaturing.

This apparatus can be supplied by the Holborn Surgical Instrument Co., Ltd.

Sydney, N.S.W. G. S. THOMPSON, F.R.C.S.

ELECTROLYSIS IN OPEN SUPPURATING WOUNDS.

THE importance of the treatment of sinuses by electrolysis, as described by Dr. C. Russ in the EPITOME of May 19th (para. 54), should not be lost sight of. It is the ideal treatment for wounds penetrating the knee-joint and will supplant all methods of dealing with this class of injury which hitherto has taxed the skill of a surgeon as no other surgical case. The electrical reaction of the knee as tested by Mr. Baines's method with the galvanometer will at once indicate the point when the treatment is carried too far. It is a treatment not only eminently suited for wounds of the knee but also thecal abscesses and tuberculous sinuses, and would save the sacrifice of many a limb as well as preserve the usefulness to a far better degree than the usual method of free incisions. Its painless application is its strongest recommendation.

London, W.C. D. N. COOPER.

Reviews.

MILITARY ORTHOPAEDICS.

THE word "orthopaedic" conveyed to many members of the British public before the war a vague idea of "something to do with the feet," an idea undoubtedly encouraged by the common practice of our colleagues in America of spelling the word orthopedic. Now, however, that military orthopaedics bulk so large in the medical press, and when so many thousand beds are devoted to this branch of surgery, even the average man must know a little more than before. In our issue of July 8th, 1916, we described the work that was being done in Vienna in the treatment and training of disabled soldiers, and only recently (May 26th) published a paper by Dr. Colin Mackenzie describing the organization which deals with this branch of surgery in this country. The Vienna Central Military Orthopaedic Hospital is in charge of the well-known orthopaedic surgeon, Professor HANS SPITZY, who has found time in the midst of his labours to publish, in collaboration with Dr. ALEXANDER HARTWICH, a book on military orthopaedic surgery,[1] in which he sets out the lessons taught him by a year's experience of war. The subject is divided into two parts—A, *Der Orthopäde im Felde*, and B, *Der Orthopäde im Hinterlande*, which last expression we take to mean anywhere behind the fronts.

A useful section is devoted to the treatment of unwounded men for such troubles as flat-foot, metatarsalgia, "foot swelling" (or injury of metatarsal bones), distortions, achillodynia, rider's bone, and so on. Some of these ailments may seem too trivial for notice, but they play a not unimportant part in unfitting men for duty. In the period 1870–1882, of upwards of 10 million men liable for service in the Austro-Hungarian army 2.2 per cent. were rejected for flat-foot alone. "Foot swelling" (Fussgeschwülst), about which so much has been written in Germany before the war, was practically unknown in our small army. Although it is not synonymous with fracture of metatarsal bones, this injury is very often present. When the surgical statistics of the war come to be made up, it will be interesting to learn whether it has become common in the British army now that it numbers millions of men of a less select physique than formerly.

For protection and maintenance of correct position during transport of wounded Professor Spitzy favours plaster-of-Paris bandages and splints, and gives directions for the application of them to various types of injury. This method has, we believe, not found much favour in our service for some obvious reasons, but the hints here given would be useful to any one who might have to apply it.

As was to be expected, Part B occupies the greater portion of the book, and, like most German works of the kind, it is divided into a "general" and a "special" part, of which the first deals with general principles and methods, while the second treats of their application to various conditions and parts of the body.

Dr. Spitzy earnestly counsels all surgeons working in military hospitals to remember that good functional results are what they should aim at, and that many bad results would be avoided if more care were devoted to seeing that unnecessary or too tight bandages and splints were not persisted with, and to giving passive and active movements as early as possible. This is a true saying. As to the necessity for prolonged treatment in special institutions, he declares that of those men who have been prematurely discharged from hospitals in order to make room for newly wounded, three-fourths will ultimately become a burden on the State.

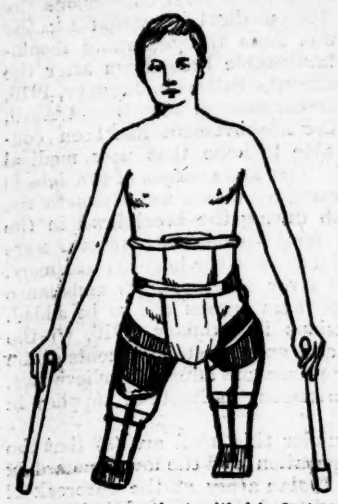
In the space at his disposal he has found it impossible to go into much detail of treatment, and therefore this book can only be considered as a guide to principles, but some points are worthy of note. In speaking of arthroplasty Spitzy says truly that at the best a pseudarthrosis and not a restoration of the natural articulation is to be hoped for. Considering his reputation in the treatment of nerve injuries, Dr. Spitzy is rather disappointingly brief in the section devoted to this subject, both in the general and the special parts of the book, but what he does say is practical and to the point. In such a work, of course, there is no room for the discussion of results of nerve suture, etc., even if the time were ripe for it. For the gradual treatment of contracted elbow, finger, and knee joints the simple apparatus of Schede is figured and recommended. Speaking of malunion of fractures of the forearm, in which the radius and ulna are united by callus the author makes the wise reflection that before undertaking an operation of which the result must be uncertain, it is well to inquire carefully whether the movements of supination and pronation are necessary in the patient's occupation. The use of specially shaped "pathological" tool handles is recommended for invalids whose hands are partially crippled, and illustrations of some of these are given.

The short directions for operations on adherent or shortened tendons are suggestive and useful. Injections of lard between the skin and other surrounding parts and the tendon are recommended in order to prevent the renewal of adhesions.

Amputations and artificial limbs are discussed in a chapter of forty-eight pages. In the lower extremity, what are called *immediatprothesen* are generally used in Austria, as they are in Belgium and some other places. This term is applied to temporary peg or patten legs, which are fitted by means of gypsum or other buckets to the stump as soon as the amputation wound is healed. The advantages of this proceeding are multiple. In the first place, the patient's health is improved by early locomotion and the nutrition of the stump becomes more like the normal. In the second place, crutches can be abandoned and such troubles as crutch-palsy avoided. Thirdly—and this is not the least of its advantages—shrinking of the soft parts of the stump is produced by the pressure of the bucket, so that by the time the adjustment of a permanent artificial limb has become advisable, the stump will have

[1] *Orthopädische Behandlung Kriegsverwundeter.* Von k.u.k. Oberstabsarzt Prof. Dr. Hans Spitzy, Kommandant des k.u.k. Reservespitals No. XI (orthopädisches Spital, und Invalidenschulen), und k.u.k. Assistenzarzt Dr. Alexander Hartwich, Wien. Mit 144 Textabbildungen. Berlin and Vienna: Urban and Schwarzenberg. 1915. (Demy 8vo, pp. x, 214.)

settled down into a more or less permanent form. This shrinking of the stump, which occurs as soon as the bucket or socket is worn, is one of the chief troubles of the artificial-leg maker, for even six months after amputation such a rapid change may occur that a bucket may have to be lined or a new one made before the patient has had the limb as long as a month. We have not as yet heard of the adoption of temporary peg legs on a large scale in our service, but it is to be desired in the interests of economy of time and money and of efficiency.



Höftman's patient with his first (immediate) substitutes. By degrees these props are lengthened until the normal length of limb is reached.

Many men who have undergone double amputation, even of the thighs, quickly learn to walk well; when, however, the thigh stumps are short, great difficulty is experienced in gaining control and in balancing. Professor Spitzy prints an illustration of a case of this kind, which was treated by Höftman, by the application of temporary pattens only a few inches high. When the patient had learnt to walk on these, which were easily controllable, owing to the shortness of the levers, they were lengthened to the full extent by two or three successive stages.

The book contains nothing novel as regards artificial arms or arm stumps, but ingenious dodges are illustrated for developing the muscles of these stumps, and Professor Spitzy reminds us of the great usefulness of forearm stumps without the intervention of any appliance whatever.

EVOLUTION IN THE LIGHT OF HEREDITY.

IN the first of the four lectures which comprise Professor T. H. MORGAN'S *Critique of the Theory of Evolution*[2] the traditional evidence for that theory is revalued. The author points out the fallacy of concluding that, because organisms or structures can be arranged in a line extending from the very simple to the complex, they have arisen in the same order. He also discredits the current interpretation, that embryonic stages common to animals on different levels of evolution represent adult ancestral stages—the so-called "biogenetic law" of recapitulation. But he does not dispute the view that the common features of the embryonic morphology of, say, the mammal and the bird indicate a common ancestry, and so far favour the evolutionary doctrine.

The author's experiments in the sphere of inheritance have convinced him that "new characters are continually appearing in domesticated as well as in wild animals and plants, that these characters are often sharply marked off from the original characters," and that "whether the differences are great or small they are transmitted according to Mendel's law." Adaptive and non-adaptive characters are, he states, inherited in precisely the same way, and evolution has consisted largely in introducing new factors that influence characters already present in the animal or plant. In the third lecture of the series the cellular basis of heredity is illustrated and its mechanism explained on the basis of the author's investigations with regard to the wild fly (*Drusophila ampelophila*). The identification of genetic factors and their localization in the chromosomes has in this species been carried to a point which may surprise many readers, and appears to justify the author's contention that the mechanism of heredity has been discovered and its problem solved. Substantially, Professor Morgan's position may be described as a return to the Darwinian or mechanistic view of evolution and a rehabilitation of natural selection as a positive evoluticuary factor. Not that he believes that a beneficial mutation renders a species more likely to mutate again in the same direction, but that individuals advantageously modified have a superior survival value, while their descendants stand a good chance of inheriting the increment and at least a "sporting" one of carrying it further in the required direction. We trust that our brief account of these important lectures will send many readers to the volume itself, which demands and deserves careful study.

[2] *A Critique of the Theory of Evolution*. By T. H. Morgan. Princetown: University Press. London: H. Milford. 1916. (Post 8vo, pp. 207; 95 figures. 6s. 6d. net.)

NOTES ON BOOKS.

THE *Handbook of Massage for Beginners*[3] gives a good brief account of the subject. The fifteen chapters into which the book is divided give descriptions of what the masseuse hopes to effect by the practice of her art, the way in which to do it, and the special details required for the treatment of various lesions by massage and movement. The last chapter, which is also the longest, gives an outline of the uses of electricity in medicine.

Dr. DHANJIBHAI HORMASJI MEHTA, of Baroda, has forwarded to us a copy of his translation into the Gujerati tongue of the little work on Indian ambulance training,[4] by Colonel R. J. BLACKHAM, C.I.E., R.A.M.C. The translator has been an active ambulance worker for the past sixteen years, during which time he has undertaken many such translations.

[3] *Handbook of Massage for Beginners*. By L. L. Despard. Oxford Medical Publications. London: H. Frowde, and Hodder and Stoughton. 1915. (Post 8vo, pp. 253; 88 figures. 6s. net.)

[4] *Prathmic Madad Karanaraone Shikshan*. Baroda: Published by the Author. 1916. (1 rupee.)

THE MESOPOTAMIA COMMISSION.

[FIRST NOTICE.]

THE report[1] of the Special Commission appointed by an Act of Parliament in August, 1916, to inquire into "the origin, inception, and conduct of operations of war in Mesopotamia, including the supply of drafts, reinforcements, ammunition, and equipment to the troops and fleet, the provision for the sick and wounded, and the responsibility of those departments of the Government whose duty it has been to minister to the wants of the forces employed in that theatre of war," was issued on June 27th.

The chairman of the Commission was Lord George Hamilton, a former Secretary of State for India, and the other members were the Earl of Donoughmore, Lord Hugh Cecil, M.P., Sir Archibald Williamson, M.P., Mr. John Hodge, M.P., Commander Josiah C. Wedgwood (late R.N.V.R.), Admiral Sir Cyprian Bridge, G.C.B., and General Sir Neville Lyttelton, G.C.B. The report is divided into twelve parts. There is a separate report by Commander Wedgwood, which differs from the report of the rest of the Commission, rather, it is said, "in emphasis than in substance," and three appendices, one containing the report of the Vincent-Bingley Commission, dated June 29th, 1916, frequently quoted in the report of the Parliamentary Commission; a memorandum by Sir Beauchamp Duff, then Commander-in-Chief in India, dated July, 1916, replying to the Vincent-Bingley report; and a report by Colonel P. Hehir, C.B., I.M.S., on the medical arrangements during the siege of Kut-el-Amara.

The first part of the report of the Parliamentary Commission is a preface dealing, among other matters, with the physical and climatic peculiarities of Mesopotamia and the condition of the Indian army on the outbreak of war. The second part relates the origin of the Mesopotamia expedition, the next seven parts deal with the military operations, the tenth is wholly devoted to the "medical breakdown," and the eleventh to a discussion of the causes contributing to the errors of judgement and shortcomings of responsible authorities. The twelfth part summarizes the findings and conclusions, and makes certain recommendations.

GENERAL CONCLUSIONS.

The general findings of the Commission are as follows, and it is important to bear them in mind in attempting to

[1] Cd. 8610. Price 2s. net.

form an opinion as to their effects on the medical arrangements and the responsibility for them.

1. The expedition to Mesopotamia was a justifiable military enterprise, but one of such a character that it required, during its inception and development, the most careful watching and preparation.

2. The division of responsibility between the India Office and Indian Government, the former undertaking policy, and the latter the management of the expedition, was, in the circumstances, unworkable. The Secretary of State, who controlled the policy, did not have cognizance of the capacity of the expedition to carry out the policy. The Indian Government, who managed the expedition, did not accompany developments of policy with the necessary preparations, even when they themselves proposed those developments.

3. The scope of the objective of the expedition was never sufficiently defined in advance, so as to make each successive move part of a well-thought-out and matured plan.

4. The attempt in India entirely to control and regulate the wants of the expedition from Simla was an administrative mistake, and representatives of the Head Quarters Staff with wide powers should from the first have been stationed at Bombay, the port of embarkation and disembarkation to and from Mesopotamia.

5. The Commander-in-Chief himself, or his representatives acting as liaison officers, should from time to time have visited Mesopotamia with a view to keeping the Head Quarters Staff in touch with the needs of the expedition. In consequence of such want of touch, the military authorities at Simla did not appreciate or realize the difficulties of campaigning in Mesopotamia, and from such lack of knowledge failed to make sufficient provision for surmounting the difficulties and drawbacks.

6. The successive advances from Basra to Kurna, Kurna to Amara, and from Amara to Kut were sanctioned as being necessary for the protection and consolidation of positions already taken, and were therefore of a defensive character.

The Commission states generally that "the weightest share of responsibility lies with Sir John Nixon," the general officer commanding in Mesopotamia, "whose confident optimism was the main cause of the decision to advance" to Baghdad, but adds that other persons responsible were: "In India, the Viceroy (Lord Hardinge) and the Commander-in-Chief (Sir Beauchamp Duff); in England, the Military Secretary of the India Office (Sir Edmund Barrow), the Secretary of State for India (Mr. Austen Chamberlain), and the War Committee of the Cabinet," for the errors of judgement to which they were parties, and which formed the basis of their advice and orders with reference to the advance on Baghdad.

Deficient Equipment.

The general armament and equipment, it is stated, "were on a scale intended for an Indian frontier expedition, were not up to the standard of modern European warfare, and quite insufficient to meet the needs of the Mesopotamia Expedition." These shortcomings, the report continues, "were the natural result of the policy of indiscriminate retrenchment pursued for some years before the war by the Indian Government under instructions from the Home Government, by which the army was to be prepared and maintained for frontier and internal use." During the period for which the Indian Government was responsible, though there was no general breakdown in the commissariat of the expedition, discomfort and want were at times experienced through lack of transport, and illness arose from serious deficiency in diet. The ration originally supplied to the Indian troops was deficient in nutritive qualities, and a serious outbreak of scurvy ensued; it is added that, though the ration has twice been improved, it still requires careful attention as to the adequacy of its nutritive powers. It is further stated that "the wants of the expedition received meagre attention and illiberal treatment at the hands of the Simla authorities during the years 1914–1915."

Deficient River Transport.

A deficiency of river transport existed from the time the army left tidal waters, and became very serious as the lines of communication lengthened and the numbers of the force increased, but down to the end of 1915 the efforts made to rectify the deficiencies were wholly inadequate. River hospital steamers—an urgent requirement for the proper equipment of the expedition—were not ordered until much too late, and the proceedings in connexion with the fulfilling of orders for river craft by the Director of the Royal Marine in India and the India Office in London were far from satisfactory.

Deficient Medical Provision.

The section of the report dealing with the treatment of the sick and wounded is long and full of details into which we cannot now enter, but in its general conclusions the Commission says that the medical provision for the Mesopotamia campaign was from the beginning insufficient, that there was a lamentable breakdown after the battle of Ctesiphon, and after the battles in January, 1916, but that there was an amelioration in March and April, 1916, and "since then the improvement has been continual, until it is reasonable to hope that now medical provision is satisfactory." The main causes of the defects of medical provision causing avoidable sufferings to the sick and wounded, which during the breakdown in the winter of 1915–16 were most lamentably severe, were in respect of the provision of (*a*) river hospital steamers, (*b*) medical personnel, (*c*) river transport, (*d*) ambulance land transport. To these main causes are to be added, in respect of the operations in January, 1916, (*e*) the absence of the medical and supply establishments of the 7th Division, and (*f*) the premature efforts to relieve Kut, in consequence of the erroneous estimate of supplies in that place.

The general findings under this head are (*a*) that the limitation of medical preparation and the low standard of medical treatment in the Indian army at the outbreak of war were the natural outcome of the policy of limiting the general military preparations of India before the war in the interests of retrenchment pursued for many years by the Home Government and the Government of India; (*b*) the failure of the Secretary of State to force at an earlier period an investigation into the treatment of the wounded in Mesopotamia; and (*c*) the failure of the Viceroy to take sufficiently strenuous and peremptory action. The following paragraphs are in full as follows:

(*d*) A more severe censure must be passed upon the Commander-in-Chief, for not only did he, as Commander-in-Chief of the army in India, fail closely to superintend the adequacy of medical provision in Mesopotamia, but he declined for a considerable time, until ultimately forced by the superior authority of the Viceroy, to give credence to rumours which proved to be true, and failed to take the measures which a subsequent experience shows would have saved the wounded from avoidable suffering.

20. There has been misuse of official reticence as to medical defects and the sufferings of the sick and wounded.

21. While the protective and sanitary work of the medical administration has in certain directions and at some periods (notably under Colonel Hehir) been commendable, yet there has not been generally sufficient promptitude in taking the precautions dictated by modern science for the protection of the troops against disease.

22. Throughout the campaign, with insignificant exceptions, the executive and regimental medical officers and personnel have devoted themselves with unremitting kindness, zeal, and industry to the care of the sick and wounded with such means as were at their disposal.

The Parliamentary Commission endorses the finding of the Vincent-Bingley Commission that Surgeon-General Hathaway, senior medical officer of the force with Sir John Nixon, "did not represent with sufficient promptitude and force the needs of the services for which he was reponsible, and, in particular, failed to urge the necessity for adequate and suitable transport for the sick and wounded with that insistency which the situation demanded." The Parliamentary Commission adds, however, as regards river and land transport, that while it was the duty of Surgeon-General Hathaway to urge its necessity, it was actually the duty of the Quartermaster-General's department and of Sir John Nixon's staff to see that it was provided.

The following paragraph from the findings and conclusions of the report may most conveniently be quoted in full:

18. The officer directly responsible for the deficiencies of medical provision in Mesopotamia is, however, the Director of Medical Services, India. This appointment was held at the beginning of the war by Surgeon-General Sir William Babtie, who held the office between March, 1914, and June, 1915, but was away from India for six weeks in February and March, 1915. He was succeeded by Surgeon-General J. G. MacNeece on July 8th, 1915, and the latter proceeded home on sick leave on April 15th, 1916. Sir William Babtie in his evidence before us impressed us as an officer of ability and knowledge, but we do not think that he brought these qualities sufficiently to bear upon the task before him. He accepted obviously insufficient medical provision without protest, and without any adequate effort to improve it. He cannot therefore be held blameless.

Surgeon-General MacNeece did not give evidence before the Vincent-Bingley Commission, but he appeared before us. He

was, in our opinion, an officer thoroughly desirous of fulfilling the duties assigned to him, but he was a man of advancing years and diminishing strength, unequal to the position he was called upon to fill, and his administration appears to us to show no signs of the vigour and efficiency that were required.

In the body of the report lengthy references are made to Sir William Babtie's responsibilities, and it is said—

The gravamen of the criticism which we feel bound to pass on Sir William Babtie is that, knowing the Army Medical Service in India to be organized only for frontier warfare, knowing the provision of the field ambulances and hospitals to be deficient, and knowing the medical personnel to be insufficient, he yet made no adequate efforts to improve these defects so as to equip the Mesopotamian Expedition in a manner suitable for campaigning in an unhealthy tropical climate against an enemy who was in alliance with and supported by the foremost exponents of modern warfare.

In other parts of the report it is stated that the stretchers and riding mules, the only land ambulance transport with the expedition, were inadequate, so that army transport carts were the only vehicles available for the sick and wounded where land transport was necessary. Padding for these carts was not always available, and "when padded they were cruel and dangerous for certain classes of wounded." The concluding paragraph with regard to this division of the subject is as follows:

Surgeon-General Babtie's omissions in regard to the Mesopotamian campaign are all the more remarkable because of his promptitude and firmness in pressing war provisions on the Indian Government which were necessary for the overseas expeditions generally. Thus, on the outbreak of war, he urged the formation of a fleet of ocean hospital ships, the construction of hospital trains, and the expansion of the Army Bearer Corps. It may be that, as we have noticed in other phases of the expedition, Mesopotamia was in medical matters also regarded as a "small side show," and did not for that reason receive proper attention to its special and unique requirements. At any rate, and for whatever reason, Surgeon-General Babtie's administration was marked by serious faults, for which he must be blamed, and the importance of which cannot be minimized. But we recognize that the shortness of his experience as Director of Medical Services when the war broke out, and the fact that he had to work in an atmosphere very unfavourable to reforming innovation, must be regarded as diminishing the weight of the censure he deserves. He is undoubtedly a man of great ability; and, having regard to all the circumstances, we desire to say that the faults of his administration were not, in our judgement, such as to prove him unfit for important, responsible administrative posts.

(To be continued.)

MOTOR NOTES FOR MEDICAL MEN.

By H. MASSAC BUIST.

The Possibilities of Coal Gas.

Though those who lay by their cars and apply for a refund of part of their 1917 licence fees on or before July 1st can secure a substantial rebate, nevertheless it is certain that no medical men in civil practice would benefit by such an arrangement. At this juncture it is quite impossible to dispense with a car if the individual practitioner has been in the habit of employing one. At the same time a medical man may not be able to secure more than a gallon of petrol a day; many have to be content with less. Unfortunately a gallon is nothing like sufficient for the average need. Most doctors travel more than twenty miles a day, which is a good average petrol consumption except in the case of the so-called light car, which would give a matter of about thirty-five miles to the gallon. It is to be assumed that no doctor will be giving up the use of his car merely on the grounds of his inability to get adequate fuel supplies. What most medical men are concerned with is how to secure adequate instead of inadequate fuel supplies, particularly in face of the fact that their work tends to increase all the time. Alternative spirits have been looked on askance in these notes, on the grounds, first, that they have not been sufficiently tested; and, secondly, that there have been no guarantees as to continuity of supply. As it is not for medical men to experiment with their cars, since reliability is the essence of the matter for them, the advice given was timely, for subsequent experiences have proved that all manner of alternative fuels have ruined engines. Of course the use of them does not even tempt the medical man to-day, because purchases of alternative fuel have to be endorsed on his petrol licence. As the cost of most of them is practically the same as that of petrol, the wise man will take out his rations in the approved article.

No Experimenting Involved.

For years before the war town gas had been used for the bench "running-in" tests of car engines at factories. About a year ago its possibilities as a fuel for motors actually in vehicles to travel along the high road began to be discussed. To-day, as far as utility motor vehicles are concerned, there are examples of them running on town gas in almost every part of the country. Inasmuch as, next to actual goods carrying, the medical man's motor car is in a sense as absolutely a utility vehicle as any type that can be named, it follows that this development is of appreciable interest to him.

The average medical man's car has been of the type generally styled the touring variety. In nine cases out of ten it is equipped with four seats, of which in most cases it is essential that two only should be used, one for the accommodation of the doctor and the other for his motor man. At a push the motor man can be dispensed with.

This question of seating accommodation is mentioned because at the moment there are only two methods of carrying town gas. One is to compress it in steel bottles, such as are used for compressed air to start air craft engines, and for oxygen. That would be a convenient method as regards smallness of compass, but when very high compressions are used there is always the possibility of such bottles detonating. Setting that aside, however, we come to the fact that to carry in such container the equivalent of three gallons of petrol only would require cylinders totalling a weight of 16 cwt., therefore that method is ruled out as frankly impossible. Instead of great compressions we must seek rather to provide accommodation for a considerable bulk of town gas on the given motor vehicle. It is easy to do this in the case of the car with covered coachwork. For example, the town gas motor bus service instituted on a 75 mile route between London and Eastbourne witnesses the choice, not of heavy gas containers, but of bulky ones as being the only alternative container for the type of gas being used. All that is necessary is merely a bag of two layers of canvas with a rubber insertion to render it water and gas tight; the capacity is about 450 cubic ft., the whole apparatus being strapped on the roof of the char-à-banc. It extends along the whole of the roofing; the shape of it at any moment indicates how much margin of gas remains to run the vehicle. To drive one of these heavy machines from London to Eastbourne and back, a distance of 150 odd miles, requires approximately 4,000 cubic ft. of gas; therefore in this case there have to be several stoppages on the road to replenish the fuel supply. When the only alternative to encountering such delays is to enjoy no facilities whatever for making such a journey in such a fashion one must put up with the periodical halts. The price of gas on that road varies from 3s. 3d. to 5s. 10d. per 1,000 cubic feet. It is found in practice that it takes 18 shillings' worth of gas to make the double journey, thus effecting a saving of £1 2s., or a handsome margin over 50 per cent. on the price of petrol for utility motor vehicles even were it available. In other parts of the country—I recall an example at Kidderminster—a lorry of the 3½ ton sort has a gas container of the same description over the cab above the driver's seat; because it has no cover over the length of the vehicle, which is of the open lorry variety. Nevertheless, the scheme does admirably. Elsewhere in the Midlands a Ford car with four light uprights to carry a collapsible container sufficient for seventeen runs on give-and-take roads with "six up" can be replenished at a war time cost which represents a great economy on the use of liquid fuel.

Great Saving of Cost.

It must be borne in mind that years before the war, even when petrol was obtainable at 10d. a gallon, it was cheaper for the manufacturers of motors to do the running-in tests on town gas. Even at the war time price of 3s. 3d. per 1,000 cubic feet of town gas the cost works out at the equivalent of petrol, if it were obtainable, at 10d. a gallon only. Theoretically, one gallon of petrol is equivalent to 273 cubic feet of coal gas. Owing to evaporation and leakage, in most cases in practice it is found that 250 cubic feet of town gas does the work of one gallon of petrol. Here it must be added that in many parts of the country, notably in the Midlands, gas costs appreciably less than 3s. 3d. per 1,000 cubic feet, which volume, in practice, is equivalent to a 4 gallon charge of petrol. Town gas gives

approximately 85 per cent. of the power obtainable by the use of the best petrol.

Nearly all the corporations that manufacture town gas are improvising arrangements for supplying it to users of utility motor vehicles. Provided the passenger car owner equips his vehicle with a gas container, it is open to him to fill it from the same source in like fashion. In certain cases a flexible fabric tube, such as is used on balloon grounds for filling sphericals, is employed; but the more general and practical way is to fit on the curb near the given gasworks a simple upright containing valve and meter gear, so that the exact amount of gas supplied can be measured, even as in certain parts of America you pull up by the roadside, drop coins into a slot, and pump petrol direct into your car without stopping at a garage or shop of any sort.

In the case of the medical man's motor vehicle of the covered limousine or three-quarter landaulette type, it is possible to put a gas container, motor char-à-banc style, on the roofing, and so have a charge for a very respectable mileage, because, of course, these lighter private machines consume nothing like the quantity of motor fuel that a char-à-banc or utility vehicle requires. For these reasons, too, the great demand for petrol for the army might be met in part by requiring all taxicabs, and even the bulk of omnibuses, to be run on town gas, thereby incidentally rendering a more adequate supply of machines available to the public despite the liquid fuel shortage. Indeed, it may well be that in the fullness of time this will be found one of the means of checking the almost disproportionate demand at the moment for steam utility motor vehicles, which, while admirable in many respects, are distinctly unsuitable for latter day road traffic.

Even the argument that to use town gas for motor service, including purely passenger work, is unpatriotic, falls to the ground in face of the fact that the more demand there is in this respect the greater the production of benzole, toluol, and kindred substances which form the basis of various high explosives necessary in ever-increasing quantity to win this campaign.

The Cheap and Simple Gas Container.

From the average medical man's point of view, the question is one of getting a container made which will fit into the back seats of the ordinary four-seater touring car, occupying the floor space as well as the back seating accommodation. The great saving effected by the use of town gas against the minimum cost of motor spirit should soon pay for the price of such a container, which could be strapped in, and therefore taken out at will as easily as a collapsible hood can be put up or down. Many of these types of cars are equipped with what is called a tonneau cover, placed over the back seating space when not in use, to cover luggage and protect it from rain when the back seats are not occupied by passengers during a tour. If a tonneau cover were employed the gas bag need not even be strapped in. It will be perceived that town gas is a form of fuel the carriage of which, incidentally, does not involve weight that represents tyre wear and tear as well as power to propel it, but that, instead, gas tends to lift a fraction of the weight of the car.

If the gas container on a four-seater touring car were made so that it would be held in position by a tonneau cover, then the medical man's position would be this—that if on occasion he had absolute need to use the back seats, he would remove the tonneau cover, take out the flexible gas container and, instead, fill up his petrol tank from his licence rations, running his car on petrol.

No Engine Alteration Necessary.

This is a great point to have in mind, as the horse-power produced by town gas is appreciably little less and calls for no alteration either to the engine or the carburrettor scheme. All that it is necessary to do is to fit a gas feed pipe to a point just above the engine throttle. An ordinary cock near the engine controls the supply, which is regulated by a lever coupled to the throttle valve lever, whereby the gas supply is increased or diminished, in accordance with the engine speed. The car can be run on petrol and coal gas alternately without any alteration. In a few months the medical man would save himself the cost of having a suitable gas container made. But at the moment no type has been standardized for private vehicles.

The demand is so obvious and abundant, and so many firms are established in businesses that could easily produce such an article, that it may be taken for granted that at no distant date some enterprising makers will come forward with standardized containers, particularly when we have in mind that, on the one hand, motor users all over the country have quite inadequate fuel rations, and have in the past actually been destroying their engines by running them on unsuitable alternative fuels, whereas it is foreknown that no harm can come to the engine by using coal gas. On the other, scores of thousands of professional and ordinary passenger car owners all over the country have had to lay by their cars because no further supplies of spirit are available. Thus, folk will gladly regain the use of their cars on almost any terms, particularly if resident in the country. Therefore, at the moment, in face of the possibilities of coal gas, it seems to me doubtful whether the majority of owners will lay by their cars and claim a refund on their licence fees when the lapse of a few months may give them town gas as a means of utilizing their cars all through the winter months, when such facilities are specially to be appreciated.

Everything, therefore, points to the fact that, in face of the large demand for gas containers, some of even the biggest rubber firms will shortly be producing the necessary article. For a passenger car it is easy to provide in small compass a sufficient charge of gas to run twenty or more miles; while in the covered variety of cars, such as limousines, it should be possible easily to provide sufficient for thirty or more miles. Inasmuch as town gas is manufactured all over the country, even if long journeys have to be undertaken it will be easy to secure supplies, particularly in face of the fact that most gas manufacturing corporations are already providing facilities for supplying such new style customers. The average medical man's work consists of journeys of twenty miles or less, so that the relative smallness of containers will not prove prohibitive, especially as gasworks are rarely a score of miles apart.

The Present and the Future.

While the average medical man is not deprived of the whole use of his car, at the moment he has nothing like adequate fuel supplies for his needs. Apart from this, anything which economizes his running costs is a notable relief in days when war prices have attained abnormal proportions. Therefore, alike during and after the war, we may look for town gas to be used as a motor fuel for a great many purposes.

It may be that after the war alternative fuels will be available in great quantities to relieve the demand for petrol; nevertheless, the cost of producing them would appear to be permanently greater than that at which town gas can be manufactured and supplied for the same service. If holders for the accommodation in the back of a four-seater touring car of the average type employed by medical men were designed to contain 250 cubic ft. of coal gas, or the equivalent of a gallon of petrol, such cars would be able to run anything from fifteen to twenty-five miles on a single charge, and light cars up to thirty-five miles. Thus, for the average medical man's work, as for station work and shopping, such a supply would be practicable.

Recharging is as expeditious as it is simple, while the new market thus already opened for town gas is one which no producer will fail to cultivate for lack of the necessary enterprise to arrange the most convenient and expeditious supply arrangements.

The post-war price of petrol will obviously exercise an enormous influence on determining whether coal gas continues to be used after the campaign; but we must, besides, remember that it is extremely unlikely that the use of town gas on motor vehicles will be specially taxed. In any case, the post-war demand for motor spirits will be sufficient on the part of the wealthier classes, because it is one which necessarily gives a longer range of travel, while for aircraft engine work there will be ever-growing demands for petrol or benzole. So town gas will probably remain untaxed, particularly in face of the fact that the greater the demand for it the greater the various by-products of ever-increasing value to the dye and other industries which it is essential to develop in this country, alike from the points of view of economy, providing labour, and of preventing the export of money for acquiring such goods from at present enemy peoples.

British Medical Journal.

SATURDAY, JUNE 30TH, 1917.

RE-EXAMINATION OF EXCEPTED MEN.

JUDGING not only from the statements on platforms, but from comments in the newspapers, it would appear that the debate in the House of Commons last week on the calling up for medical examination of excepted men has produced a somewhat confusing effect on the public mind. The indictment made by the mover and seconder of the motion which brought on the debate was directed against the War Office and the constitution and work of the medical boards, and many casual readers have undoubtedly gathered the impression that the last named have failed in their duty. This is not the case.

As a matter of fact the indictment was an indictment of the House of Commons itself for passing the Military Service (Review of Exceptions) Act, which came into force last April, without sufficient consideration and without the introduction of safeguards which are now considered to be necessary. The Act gave the Army Council authority to require certain classes of men excepted from the operation of the Military Service Act, 1916, to come up for examination on a date to be notified to them. The Act applied to members of the Territorial Force not suited for foreign service, to men who had left or been discharged from the naval or military service in consequence of disablement or ill health, and to men previously rejected on any ground, provided that a man should not be required to submit himself to re-examination within six months of his previous and last rejection or discharge, unless the Army Council considered that there was ground for the opinion that the previous rejection or discharge was obtained by fraud. The Act did not apply to a man engaged in agriculture whose work was certified to be of national importance, nor to any officer or man discharged in consequence of disablement certified by the Admiralty or the Army Council to be the result of wounds, including injury from poisonous gases, or in consequence of neurasthenia or allied functional nerve disease certified by a special medical board to be the result of naval or military service. The interpretation put upon the terms of the Act involved the issue of notices to a million or a million and a quarter men, although the War Office did not expect to get more than 60,000 men for the fighting ranks ("A" men) and another 60,000 for other categories, who would release men now employed behind the lines. Incidentally, the Under Secretary of State for War said that it required one and a half men to keep one man in the trenches.

The allegation was that the notices were sent out not only to men who had obtained fraudulent rejection, not only to men who in the past had been carelessly examined, and not only to men who, there was reason to believe, had improved in health, but also to the halt, the lame, the blind, the mute, the mad, and even the dead. This last is a picturesque statement which has produced more effect than it is worth when the difficulty of tracing addresses is remembered. If any men disabled in the war had been passed into the service it was a mistake, Mr. Macpherson said, and they would get their discharge; but he pointed out that the notice sent to a man contained a form which he could fill up, stating his claim that he was not liable to receive the notice; if he sent this form duly filled up to the recruiting officer he would hear no more about it. We have reason to know that this did not always happen and that the form has been returned with an intimation that the recruiting officer attached no value to it. Mr. Macpherson added that the Government was now prepared to say that all men who had served abroad and had been discharged from the army but came compulsorily under the Act, if they made a claim, would at once be finally discharged—that is to say, every soldier disabled by wounds or discharged through sickness or ill health abroad would be excepted.

This may have been the original intention, but if so it was not clearly expressed; the official statement now made will do something to relieve the situation, for it is easy to see that the almost simultaneous issue of such an enormous number of notices put a very great strain on the organization of the medical boards. Mr. Macpherson said that men had been examined at the rate of 15,000 a day; this would give a total of between 600,000 and 700,000 examinations since the Act came into operation. The recruiting medical boards, though not constituted to deal with a sudden influx of work on this scale, have risen well to the occasion, in spite of the depletion due to the demands of the army for medical officers to serve in the R.A.M.C., and steps were taken where experience proved it to be necessary to strengthen the boards or to increase their numbers.

The organization of the recruiting medical boards in relation to the Military Service Acts had come under review towards the end of 1916, and in December of that year Colonel James Galloway, C.B., physician to Charing Cross Hospital, who had been serving as a consulting physician with one of the armies abroad, was called home and appointed Inspector of Recruiting Medical Boards in the Directorate of Recruiting. As our readers are aware, he has inspected not only the permanent medical boards but many of the temporary boards established throughout the country, and has discussed with their members the medical problems arising. Before the Review of Exceptions Act was passed the War Office had issued additional instructions, and later on, before the Act came into force, steps were taken to obtain the full complement of medical examiners for each board, and to establish new boards where necessary; but difficulties were inevitably encountered in finding a sufficient number of men to undertake the work, owing to the heavy demands on the profession by the navy and army, and the need for maintaining as adequate attendance as possible for the civil population. The difficulties, however, were to a large extent surmounted by the good will of the civil members of the profession, who consented to serve as members of the examining boards; some such members give whole-time service, but the majority, we believe, give part-time service, serving in rotation as required. When the new Act came into force, the boards became very busy all over the country; in many places they were hard worked; at a few the number of men coming forward for examination was larger than the boards could examine with any approach to doing satisfactory work, and special steps were taken to enlarge the boards and to reduce the number of men coming up on any one day.

The responsibility now thrown upon medical examining boards is very great. Under the old conditions of our small standing army, a recruiting

medical officer was required to determine only whether a man was fit for general service or not; gradually, as the numbering of the people has proceeded and the comb has become finer, medical examining boards have been instructed to make a much closer classification. Men passed into category A are classed as fit for general service—that is to say, fit to be trained as soldiers at once or after a period of preliminary physical training. Everybody else would have been rejected under the system applicable to the old army, but now there are other categories. First of all, category B, which is divided into three classes: B 1, men who can be employed abroad in garrison duty, or B 2, as labourers on roads, railways, and so forth, or B 3, in sedentary employment, such as clerks, storekeepers, bootmakers, tailors, and so on. The next category is C, men suitable for service at home, in which is now included North-West Europe; this, again, is divided into three categories: C 1, garrison duty, C 2, labour, C 3, sedentary. The next category is that of men relegated to the reserve—that is to say, men whose existing disability is so considerable that the board believes that it would be useless to re-examine them again for six months. Next there is the small category of men in whom the examination is not completed because they are suffering from some transient illness; they are sent away to be called up for re-examination after an interval of a month or two, when it may be expected that they will have recovered. Finally, there is the category of men permanently unfit for service. Thus we have at the lowest estimate nine categories, leaving out that of men whose examination is not completed owing to transient illness, and into one of these it is the duty of the medical board to put every man.

To determine this point the medical examination must be careful and discriminating, and must involve much greater expenditure of time than when the class of men called up contains a large proportion of those presumably fit. We are fully prepared to accept Colonel Galloway's assurance, quoted to the House of Commons by Mr. Bonar Law, when he said that though there must be errors from time to time among the number of decisions arrived at by the medical boards, and cases in which difference of temperament of the men under examination and the medical examiners give rise to friction, he had everywhere been struck by the patience and courtesy shown by members of the medical boards in cases where these qualities had been subjected to severe strain. If we take the estimate above, founded on Mr. Macpherson's figures, that 600,000 men were examined in something like six or seven weeks, it is obvious that a very small proportion of mistakes will make an imposing total. If, for the sake of argument, we assume that mistakes were made in 1 per cent. of the cases, we should have a total of 6,000 aggrieved men, or at the rate of 10 to each member of the House of Commons; so that Mr. Asquith's statement that some members found many such complaints in their letter-bags is not surprising. But we do not believe that the mistakes have amounted to anything like 1 per cent. That, nevertheless, there have been cases of hardship, partly due to the wholesale calling up of men who, when seen, were obviously unfit, and partly due to the small percentage of the mistakes made by medical boards, no one would care to deny, and the Select Committee appointed by the House of Commons is instructed to recommend measures for preventing or diminishing all such cases of grievance. Although this body does not strike us as being particularly well chosen, it may probably be trusted to get at the facts and to make recommendations which will save the House of Commons from making similar mistakes in the future. For that purpose it should welcome assistance from the small committee, appointed by the Council of the British Medical Association at its meeting on June 27th, to watch over medical interests in this matter.

Dr. Galloway's testimony to the medical boards is thoroughly well deserved. Mr. Bonar Law said that in Dr. Galloway's opinion these medical boards, the members of which are almost entirely civilian, though some of them hold temporary army commissions, are rendering a great service to the country and are not getting credit for it.

THE MESOPOTAMIA REPORT.

"IN introducing the Indian Financial Statement for 1915-16 Sir William Meyer, the Finance Member (of the Council of the Governor-General of India) stated 'our chief economy occurs under the Military Services,' and, though the war had already been waging for more than eight months, he budgeted for a military expenditure half a million less than the corresponding expenditure for the previous year." This is a quotation from the report of the Parliamentary Mesopotamia Commission, and in another part of the report we find the same Finance Minister objecting to providing a railway in Mesopotamia, on the ground that he was "somewhat sceptical as to the line being at all so remunerative as represented, at any rate for some time to come. . . . We have at present no right to act as if we were certain of getting Mesopotamia or a very considerable portion of it after the war" (*sic*). Again, we read: "Pertinacity in pressing or multiplying the requisitions from Mesopotamia upon the Simla authorities was resented," and the following remarkable illustration is given: "General Cowper was Adjutant-General and Assistant Quartermaster-General of the Mesopotamia Force. In January, 1916, he, being the officer responsible for the transport, became seriously alarmed at the increasing difficulties which the shortage of transport created in the employment of troops for the relief of Kut. In consultation with General Money, Chief of the General Staff, he drafted a telegram in which they stated plainly that unless they got adequate shipping transport and personnel to man such transport, Sir Percy Lake, who had recently assumed command of the force, would have to abandon the idea of relieving Kut. They purposely had recourse to this language as they considered the position—to use General Cowper's own words—'so frightfully serious.' Sir Percy Lake carefully considered the telegram, and transmitted it after some alterations. In reply, Sir Percy Lake received a personal telegram from the Commander-in-Chief at Simla, severely rebuking him for the wording of the telegram, and the Commander-in-Chief added these words: 'Please warn General Cowper that if anything of this sort again occurs, or I receive any more querulous or petulant demands for shipping, I shall at once remove him from the force, and will refuse him any further employment of any kind.'"

These passages deserve to be preserved for the wonder and instruction of succeeding generations. They go a long way to explain much of what is most distressing in the report of the Mesopotamia Commission, and it seems to us that Sir William Meyer's name should have appeared among the long list of officials and politicians whose failure to rise to the occasion is the

subject of its animadversions. The Commission, indeed, in discussing Sir William Babtie's short period of administration as Director of Medical Services in India, refers to the atmosphere which he found at Simla—"very unfavourable to reforming innovation"—as diminishing the weight of any censure he may deserve. The whole report confirms the exactness of Sir Victor Horsley's summary of the facts in the letter[1] which he wrote to the Editor of this JOURNAL ten days before his lamented death at Amara. He said that the appalling failures in the medical arrangements in Mesopotamia were due to the utterly defective transport, and that these failures were bound up with the question of the present extremely unsatisfactory relation between the Financial Department of the Indian Government and the Medical Services; he went on to express the fear that the case of the responsible medical officers in Mesopotamia might be prejudiced, by which we understood him to mean that there would be an endeavour to make the Medical Services the scapegoat, to bear the sins of other departments.

The Parliamentary Commission, however, has been comprehensive in its distribution of blame, so comprehensive, indeed, inasmuch as it includes Mr. Asquith's War Cabinet, as well as the Governor-General and Commander-in-Chief in India, the Secretary of State for India, and the Military Secretary of the India Office at home, that it may mobilize forces which will be interested to make the medical services the scapegoat. We confess to seeing some signs of this in the lengthy discussion on Sir William Babtie's alleged failure to beard the finance minister of the Government of India and in the severe censure passed upon Surgeon-General Hathaway. The main grounds for this censure are that he did not represent with sufficient promptitude and force the needs of the medical services for which he was responsible, and, in particular, failed to urge the necessity for adequate and suitable transport of the sick and wounded with that insistency which the situation demanded. The Commission observes that though it was the duty of Surgeon-General Hathaway to urge the necessity of improving transport for sick and wounded, it was actually the duty of the Quartermaster General's Department and of the staff of the general officer commanding to see that it was provided. Further, it is only right to remember that the primary responsibility for sending the force to Mesopotamia unprovided with means either for preventing or treating disease, or any adequate transport for the wounded, rests on the Government of India. The Commission condemns the "misuse of official reticence as to medical defects and the sufferings of the sick and wounded." It is clear that this condemnation is well founded, and that Surgeon-General Hathaway must take a large share of the blame. There was an optimistic telegram on December 7th, 1915, and though the responsibility for its terms has not been completely fixed, it must be interpreted as expressing Surgeon-General Hathaway's view at that time. He appears also to have failed to inform the D.M.S. in India of "the often deplorable conditions of the hospitals at Amara and Orah," or of the deficiency of vegetables, fresh meat, etc., and he reported in February, 1916, that the water for drinking and cooking was absolutely safe, whereas the Commission finds that "the defects in water supply caused considerable illness in the forces, and necessitated a large expenditure before it was remedied."

[1] BRITISH MEDICAL JOURNAL, August 19th, 1916, p. 251.

We assume that the defects disclosed by the Commission as having occurred during the earlier part of the operations in Mesopotamia have been remedied, although there are passages in the report which show some hesitation, and there are facts within our knowledge which make us doubt whether there may not be need for immediate action to increase, at any rate the equipment, of Indian medical units sent out of the Peninsula.

An important part of the report deals with the defects of military medical organization in India, and makes certain recommendations with which and with other matters arising out of the report we hope to deal later, but we may at once say that some of the defects mentioned have been pointed out again and again in our columns and in numberless reports pigeon-holed in the offices at Simla. Many men who have served in various capacities under the Government of India, including among them some who have held very eminent positions, do not hesitate to assert on their return to this country that the Government of India is rotten at the core. The report of the Parliamentary Commission on Mesopotamia goes very far to support this statement, and we hope that if and when the report is discussed in Parliament the debate will be directed mainly to fundamental considerations, and that energy will not be frittered away in personal recrimination.

CARE OF THE DISABLED SOLDIER.

IN recent articles on military orthopaedics we have made it plain that the country, in accepting responsibility for the welfare of disabled sailors and soldiers, undertakes the definite duty of restoring them, as far as is humanly possible, to a state of efficiency in which they will be neither a burden to themselves nor to the community. The obligation incurred by the State towards those who have been maimed in its defence does not cease with the granting of a pension at the moment when military medicine and surgery have completed their task. It would be a calamity if these men on discharge from the army were encouraged to lead an idle life on a pension, or to wander into blind-alley occupations in which they could not hold their own in competition with the great number of able-bodied men who will return to civil life after the war. The main object, therefore, of the organizations which we now have in this country is to help these disabled men to help themselves. To understand the nature of the problem and the means already taken for solving it nothing could be more useful than the memorandum on the treatment of the disabled soldier prepared by Sir Alfred Keogh for the inter-allied conference recently held in Paris. This general survey of the field has been published in the new periodical *Recalled to Life*,[1] which we noticed in last week's JOURNAL. In this country the well-being and future efficiency of the discharged and disabled soldier have been entrusted to the care of two organizations—the Pensions Ministry, which fixes rates of money payment to meet varying degrees of disability, and the Statutory Committee of the Royal Patriotic Fund Corporation, which provides for the after-care of soldiers handicapped by disease or injury contracted on military duty. The local committees of the latter body, by uniting after-care with duties in relation to the payment of pensions, link up the two organizations, and are thus collectively the pivot of the whole system. The pension question having been entrusted to the Ministry of Pensions, and the primary curative treatment being undertaken by the military and auxiliary hospitals, the duty of industrial re-education, employment and general after-care of the discharged men devolves upon the local committees, whose activities are co-ordinated by

[1] London: Bale, Sons and Danielsson. (2s. net.)

joint committees established for each area. In order to secure continuity of effort representatives of the local committees come into touch with the disabled soldier before he leaves hospital. With regard to the curative industries which form so valuable a part of the work of orthopaedic hospitals, Sir Alfred Keogh is emphatic in insisting that these are essentially treatment; they often pave the way for industrial re-education, but primarily they are a form of mechano-therapy in which the patient takes a willing and intelligent part. Re-education proper is thus deferred until the man on discharge from hospital comes under the care of the local committee. Here the co-operation of employers of labour, and teachers in technical institutions, is of the utmost importance.

ANTHRAX AND SHAVING BRUSHES.

THE Local Government Board has published a report by Dr. Francis Coutts on an inquiry into cases of anthrax suspected to be due to the use of infected shaving brushes.[1] Most of these were cases of external anthrax, but in a few the disease seemed to be generalized from the onset. In nearly every case the lesion was situated in the shaving area of the face and neck. Suspicion fell at once on the shaving brush, and in some of the brushes examined living anthrax bacilli were found. In an early case investigated by Dr. Elworthy the infection was clearly proved to be due to the use of a recently purchased cheap shaving brush of imitation badger hair with a bone handle. Virulent anthrax spores were found in this and in several unused brushes of the same pattern purchased from the same shop. All the brushes were traced back through the tangle of trading arrangements to one wholesale dealer and were found to have been manufactured in a single factory. Dr. Coutts, in association with Dr. Collis, of the Home Office, showed that the bristles used in making these shaving brushes consisted for the most part of Chinese horsehair, posing as goat's hair, which had not been disinfected before being manufactured into brushes. The remaining unmanufactured hair from the same source was found to be largely infected with anthrax spores. Dr. Eastwood is still investigating the precise conditions which must be fulfilled to ensure sterilization of horsehair, and the Local Government Board is considering what administrative action is needed to secure that hair used in the shaving-brush industry is satisfactorily sterilized before manufacture. As four further cases of anthrax were traced to brushes of foreign make it will be necessary also to secure that imported brushes are similarly free from infection. Dr. Coutts's interesting report shows that although the danger of anthrax from infected shaving brushes is limited in extent, it constitutes an appreciable risk which ought to be removed.

STUDIES OF INTESTINAL DISEASES FROM THE MEDITERRANEAN.

THE Medical Research Committee has published under one cover two further reports[2] upon investigations in the United Kingdom of cases of intestinal diseases received from the Eastern Mediterranean. The first of the new reports gives an account of the work done by Dr. Paul Fildes and others working at the Royal Naval Hospital, Haslar, upon a large number of men, mostly healthy convalescents, arriving from abroad with histories of having suffered from intestinal disturbance. They were examined to find whether they had had any infective intestinal disease, and whether they might be safely returned to duty without risk of infection to others. Agglutination tests were relied on almost entirely. Owing to the inherent fallacies in these tests no exact conclusion could be reached, but it seemed probable that at least one-third of the men examined had had typhoid, or one of the paratyphoid fevers, while at least 11 per cent. had had bacillary dysentery. The number of carriers among these men was small. Dr. Fildes, in conclusion, testifies to the value of antityphoid inoculation in greatly diminishing the number of typhoid infections. He is of opinion that by the methods of inoculation in use in the navy the incidence of typhoid may be reduced in the proportion of three to one in the first year after inoculation, but that after one year no effective protection is given. The second report gives details of special studies undertaken by Captain S. R. Douglas, Captain L. Colebrook, and Dr. Parry Morgan on the clinical and bacteriological aspects of dysentery, in the beds under the direction of the Medical Research Committee at St. Mary's Hospital, London. This work aimed at elucidating a limited number of cases by very thorough inquiry, with a view to supplementing the observations made elsewhere on the ordinary lines. The close proximity of ward to laboratory permitted systematic research for many possible causes of the disease beyond the classical types of infection. It is noteworthy that of the twenty-nine cases so studied only three gave evidence of infection by the classical dysentery bacilli. Other bacterial types foreign to the normal intestine occurred in much higher proportion. These were systematically investigated, and the pathogenicity of at least five of them was established. From this the Committee draws the conclusion that these less familiar bacteria are not only capable of causing intestinal disease but may have played an important part in the Gallipoli epidemic. It is satisfactory to note that the treatment of these infections by appropriate vaccines, made from the abnormal faecal bacilli, was followed by rapid improvement.

ARMY MEDICAL REPORT, 1913.

IT is impossible to feel any very strong interest in many of the details in the *Report on the Health of the Army for the Year 1913*,[1] but though circumstances have changed so greatly in the intervening years in contains some observations of present importance. The Director-General is able to point out that enteric fever, dysentery, alcoholism, tuberculous and venereal diseases, all gave lower ratios in 1913 than in the previous year. The increased use of salvarsan in the treatment of syphilis resulted in a still further considerable decrease of 5½ days in the average duration of each case of this disease. Inoculation against enteric fever continued to give overwhelming proof of its efficacy. A noteworthy instance was afforded in Mauritius, where, of a garrison of 1,166 non-commissioned officers and men, all but 77 were inoculated; the only two cases of enteric fever which occurred were among these 77 men. Over 93 per cent. of all European troops serving in India had been inoculated. In the 5th (Mhow) Division the percentage had reached 97.8, and there were some British infantry units in which every non-commissioned officer and man had been inoculated. Practically in every garrison all Indian cooks, mess servants, and others having anything to do in handling food, were inoculated as a routine matter. Of the 85 cases of enteric fever in 1913, 61 occurred among the inoculated and 24 among the non-inoculated. There were 8 deaths among the inoculated, and 8 among the non-inoculated. Among the non-inoculated the admission-rate for enteric fever was 5.3 per 1,000 of non-inoculated strength, and the death-rate 1.76. The ratio of admissions per 1,000 of inoculated strength was 0.9, and the ratio of deaths 0.12. Combining enteric and paratyphoid fevers, the admission-rate among the inoculated was 2.1 per 1,000 of strength, while among the non-inoculated it was 5.5, the corresponding death-rates being 0.15 and 1.76. As the protective influence of primary inoculation is greatly lessened after two years, reinoculation after that time is urged. Some infantry battalions in India had not had a case of enteric fever for over two years, and it was ascertained that in these units Indian cooks were not employed and inoculation had been adopted by all ranks almost universally. A review of all the circumstances surrounding

[1] H.M. Stationery Office. 1917. New series, No. 112. Price 6d. net.
[2] Special Report Series, No. 6.

[1] Cd. 8445, price 2s. 6d. net.

enteric fever in European troops in India led to the conclusion that the progressive decline in the prevalence of the disease was due to the high proportion of men protected from infection by anti-enteric inoculation, to the detection of "carriers" in barracks, to the elimination of convalescents by sending them to special enteric dépôts in the hills, to the practice of night-soil incineration, and to consistent effort to improve the sanitary condition in barracks and their surroundings.

TETANUS LIGHTED UP BY OPERATION.

WE have received notes of a case which illustrates the danger of disturbing old wounds. A man was wounded in France in September, 1916, by shell fire, a compound fracture of the right radius being produced. He probably received a prophylactic injection of antitetanic serum at the time when he was wounded, but there is no documentary evidence of this. In April, 1917, more than two hundred days after injury, the wound was firmly healed but the radius still remained ununited. An operation for bone grafting was now undertaken, but a prophylactic injection of antitoxin was not given. Six days later tetanus set in, and in spite of vigorous treatment the man died after an illness of only three days. Apparently anaërobes lurked in the depths of the tissue, for shortly after the operation the wound became very septic. The case is an example of the peculiar danger which attaches to compound fractures, and also the importance of giving a prophylactic injection of antitoxin before disturbing an old wound. The surgical treatment of wounds has an important bearing on the incidence of tetanus, and some medical officers in military hospitals at home are dissatisfied with the condition in which wounds treated by the salt and allied methods reach them. It contrasts unfavourably, it is said, with the clean, sweet-smelling condition of those treated by the old Listerian method of antiseptic dressings such as the double cyanide of mercury and zinc gauze, or iodoform.

SYNTHETIC SUNSHINE.

THERE seems to be no English equivalent for *esprit de corps*, a phrase we must have borrowed from the French some long time ago, for it does not appear to be in common use by them to-day. Nor do we know any English equivalent for *genius loci*, defined by the *Concise Oxford Dictionary* as the "presiding deity, associations, etc., of the place." Yet both sentiments may be developed in their most intense form on British soil; witness the first in the regiment, and the second in school or college. Both are as capricious in their growth as an alpine plant in the lowlands. They will not gather strength in one place where everything seems favourable to them, and luxuriate where they have apparently little encouragement. Why should both be strong in a territorial general hospital, designated by a number, established in a building devoted to quite other purposes until August, 1914, and staffed by men the majority of whom had never seen or heard of the rest before that fateful month? Yet that the sentiments are strong in the 3rd London General Hospital is proved not only by the monthly periodical conducted by the staff, but by a portly quarto for a copy of which we are indebted to the literary editor, Lance-Corporal Ward Muir, R.A.M.C.(T.). The volume is entitled *Happy Though Wounded*,[1] and opens with an article by the O.C., Lieut.-Colonel Bruce Porter, whose portrait, after a bronze bust by Lieut. Derwent Wood, who turned aside from his military duty of making masks for facial disfigurements to model it, forms the frontispiece. Like the *Gazette* of this hospital, the new volume is very strong on the artistic side, and of all the sketches by Private Nevinson we remember to have seen, none exceeds in sardonic humour his mathematical diagram of hospital stores marked "urgent." There is a delicious little drawing of a "complained of fish" incident, by Private J. H. Dowd, and, to cut this part of the subject short, let it be said that there are as many pictures as pages, but some of the photographs chosen show how badly good photographs show up when mixed with drawings. In spite of the fact that the literary editor is only a lance-corporal, while the artists are lieutenants and sergeants, the literary pages reach as high a standard as the drawings, and there are some moving poems and one or two excellent stories. All the writing and all the drawings have been done in the hospital, and the volume is sold for the benefit of its benevolent fund.

[1] *Happy Though Wounded!* The Book of the 3rd London General Hospital. London: Country Life, Limited. 1917. (Cr. quarto, pp. 142. 2s. 6d. net.)

THE "KEW BULLETIN."

WE recently commented on the suspension by the Government of the publication of the *Kew Bulletin*, on the ground that it is not essential. The British Science Guild has now sent a communication on this subject to the Secretary of the Treasury protesting against the taking of such action without consultation with economic botanists and others concerned with the commercial aspects of plant products. The suspension of the *Kew Bulletin* is particularly regrettable at a time when every effort should be made to promote the development of the plant resources of the empire. The memorandum briefly summarizes the useful purposes served by this publication during the thirty years of its existence, and goes on to say that without knowledge of these functions and an intimate acquaintance with what the *Bulletin* has accomplished in providing information not accessible in any other form as to the capabilities of the various parts of the empire for the cultivation of plants of economic importance, no Government official is capable of deciding whether the *Bulletin* is an essential publication or not. The guild urges, therefore, in the interests of imperial development, that the Government's decision be submitted to a competent tribunal which will take into consideration not only the shortage of paper, but also the value of what is printed on it. We have already given our opinion on the false economy of suspending the *Kew Bulletin*, and we are glad to learn from the statement by the President of the Board of Agriculture that the matter is now being reconsidered by the Publications Committee, and that he hopes it will be possible to resume publication of this valuable periodical.

THE HALF-YEARLY INDEXES FOR 1917.

THE usual half-yearly indexes to the JOURNAL, to the EPITOME, and to the SUPPLEMENT have been prepared, and will be printed. They will, however, not be issued with all copies of the JOURNAL. Any member or subscriber who desires to have one or all three of the indexes can obtain a copy of what he wants, post free, by sending a post-card notifying his desire to the Financial Secretary and Business Manager, British Medical Association, 429, Strand, W.C.2. Such copies will be dispatched shortly after the middle of July.

THE next meeting of the Oxford Ophthalmological Congress will take place at Keble College, Oxford, on Thursday, July 12th, and Friday, July 13th. Papers will be read and discussions will take place in the department of human anatomy in the university museum, where scientific and commercial museums will also be held. The first day will be devoted to a discussion on the correction of errors of refraction, to be opened by Dr. George M. Gould, of Atlantic City, U.S.A., and Lieut.-Colonel R. H. Elliot. The morning of the second day will be given up to addresses and demonstrations, while in the afternoon cases will be shown and discussed at the Eye Hospital, and short papers will be read. The Master of the Congress is Mr. Sydney Stephenson, the deputy master Mr. Philip H. Adams, and the honorary secretary, Mr. Bernard Cridland, Salisbury House, Wolverhampton.

Medical Notes in Parliament.

Medical Re-examinations of Excepted Men.

PARLIAMENTARY COMMITTEE OF INQUIRY APPOINTED.

THE working of the Review of Exceptions Act was debated in the Commons on June 21st, Mr. Pringle moving to reduce the War Secretary's salary in order to raise the whole question of the conduct of the tribunals, the decisions of medical boards, and the action of the War Office in the matter generally. The discussion occupied the sitting, but early in it Mr. Macpherson promised the appointment of a Parliamentary Committee of Inquiry, and Mr. Pringle at the close withdrew his motion. He said he regarded the attitude of the Government as "a plea of confession and avoidance," and expressed the hope that the terms of reference and the names of the Committee would be announced at the earliest possible moment.

Mr. Pringle complained in the first place that the military authorities had, by their conduct, outstepped the objects of the measure. The bill was passed on the assumption, he said, that there were available for military service men who had in the past been improperly rejected, either on account of the "complacency of medical officers," or on account of malingering; there was also a third class of men—those whose health had materially improved since their former examination, and who should be available for military service. His contention in this regard was that the recruiting authorities had shown no discrimination in the way in which men had been called up. In nearly every area in the country notices had been sent, not only to all who might come within the descriptions he had given, but the authorities had also called upon the halt, the lame, the blind, the mute, the mad, and even the dead, to appear before these examining boards. His second complaint was that when men called up were admitted to re-examination they were, as a rule, treated with the utmost harshness. If they presented evidence regarding their medical condition their certificates were systematically ignored, and often torn up in their faces. The examination itself, he said, was of a perfunctory character. It was true that there were usually three medical officers present, but in the great majority of cases the decision rested with the military officer, who was chairman of the board. Mr. Pringle further alleged that men who were passed in lower categories in the labour units were frequently subject to re-examination by travelling boards and passed in the higher categories. Having stated that he could, if desired, produce a mass of correspondence in support of his allegations, Mr. Pringle submitted that practically in every area in the country there was testimony that the authorities were acting "with wanton cruelty and inflicting hardships which were not only a matter of serious consequence to the men, but which were also having very important and mischievous results in relation to the actual conduct of the war."

The motion to reduce the War Secretary's salary was seconded by Sir Godfrey Baring, chairman of the appeal tribunal in Hampshire, which, he said, had had between four and five thousand cases. Their confidence in medical boards had, he declared, been very soon rudely shaken, and he went on to give a number of cases to justify this view. He quoted three of men passed by the medical board at Winchester for Class A, sent up to the Central Medical Board, and totally rejected for military service. He said he could give innumerable cases where men had been passed A 1 and B 1, garrison duty abroad, who, in a few weeks, when their health could not possibly have deteriorated, had been entirely rejected or reduced to a very low category by the Central Medical Board. He hoped that if the War Office had any scheme to call up men who had been classified B 3 and C 3 in order to see if some form of military training would improve their physique and improve their health, it would immediately be abandoned. Without casting any reflection on the honour or integrity of the chairmen of the district medical boards, who were members of the Royal Army Medical Corps, he thought it must be evident that men who were dependent on the War Office for their professional advancement must wish to do what they thought the War Office required. He believed that these men thought that what the War Office required was quantity and not quality, and he pleaded for a definite statement that it should be quality and not quantity that the Army Council should seek. He said he would like to see a larger number of civilian doctors made chairmen of medical boards.

Mr. Macpherson (Under Secretary for War) asked the House first of all to remember the grounds upon which the Review of Exceptions Act was passed. There had been many cases in which men had been rejected by a recruiting sergeant without seeing any medical officer. Others had been rejected through fraud—bribery, impersonation, doping; chemical and bacterial maiming were some of the artifices employed. Recently in one city no fewer than 25 per cent. of the men re-examined under this Act proved to be "A" men. A third ground of rejection had been that men had attempted to enlist in select corps where the social standard was high. They were rejected on personal grounds, but these grounds were described as medical. There was the fourth ground of rejection—namely, of being invalided out of the service on account of ill health. On the re-examination of a million or a million and a quarter of men they had not expected to get more than a hundred thousand, and when amendments were introduced into the bill they reduced that estimate to sixty thousand. As a result of the examinations so far conducted he understood they might hope to get, when these examinations were completed, sixty thousand "A" men and sixty thousand for other categories. In speeches delivered all over the country the suggestion was conveyed that all these men who were called up were intended to be used for fighting purposes in the trenches. It required "one and a half men" in other capacities to keep one man in the trenches. He further complained of insinuations that men who were suffering from wounds or poisonous gas and neurasthenia were called up for service. In the Statutory Order sent to every man liable to be called up for re-examination the exemptions were clearly and simply stated. Further, the Government was now prepared to say that all men who had served abroad, and had been discharged from the army, but were now coming compulsorily under this Act, would be finally discharged if they made a claim. Thus every soldier who was disabled by wounds or discharged by sickness or ill health abroad would be excepted under this Act. Mr. Macpherson went on to deny that secret instructions had been given to medical officers, and challenged Mr. Hogge, who had alleged that they had been given, to produce them. [Mr. Hogge said he had seen them, and asked for a pledge of complete immunity for men concerned if he produced such instructions.] Mr. Macpherson reaffirmed that only a single instruction had been given, and that was contained in the Army Council Order. He proceeded to read a great part of it, the substance being that every consideration should be given to every man called up for re-examination. This instruction was sent, he said, to all medical officers. Examinations had been going on at the rate of about fifteen thousand men a day, and these enormous numbers had to be coped with by a very much depleted staff of capable medical officers. Mr. Macpherson described the procedure adopted in the appointment of a medical board. If the board was in a rural district the President asked the local doctors to assist him, and the board was invariably composed of no fewer than the President and two men; the average board consisted of the President and four men; and at least three doctors passed each individual case through their hands. If it happened to be an important centre and not a rural area, the local Medical Executive War Committee found the personnel of the board and formed the panel, and in that case, too, he understood that the medical board invariably consisted of the President and at least two men; sometimes the President and four men. The person under review had the power, after he had been examined by the medical board, of appearing before the tribunal, which might give permission for him to go before a special medical board. There were three of these boards—in Edinburgh, Leeds, and London—presided over by distinguished surgeons. Recently the War Office had also appointed inspecting officers. They had the advantage of having at head quarters the services of Colonel James Galloway, senior physician at Charing Cross Hospital, and they had travelling inspectors under General Burney; six of these had visited every medical board in the country. The Director of Recruiting had himself gone and inspected the board at Manchester. In conclusion, Mr. Macpherson

said that the Government had looked most carefully into all cases submitted to it, but was quite willing to appoint a small Parliamentary Committee to examine into the working of the Act. All it asked was that in common courtesy they should have the opportunity, before coming to the House, of investigating the cases which were brought to notice for the first time within the walls of the House.

Mr. Asquith said that no member of the House could recall the contents of his letter-bag during the last six weeks without feeling that the 120,000 men had been got by means which had excited widespread displeasure and indignation. He did not make any charge against the War Office, and he was glad that the circular which the Army Council issued was going to be made public. It seemed to him to have been well conceived and well expressed, but all their experience showed that in matters of this kind the best intended and the best expressed instructions, and, indeed, the best paper safeguards that could be invented would not in circumstances such as these prevent the recurrence of gross local and personal cases of hardship. As showing the difficulties of dealing with men brought up for re-examination, Mr. Asquith quoted the experience of the appeal tribunal for the county of London of the results of medical re-examinations for the five months ended May 9th, 1917. This important tribunal sat in five or six committees, and it was a significant fact that the total number of cases brought before them during the five months did not exceed 490 or, roughly, 500 appeals. These 500 cases must be the residuum of thousands, perhaps of tens of thousands, of decisions by the tribunal of first instance. It was an inevitable drawback to a system of this kind that the men who came before the tribunal of first instance, through ignorance, through want of means, through want of time, through want of advice, for a hundred other reasons, were unable, even in some of the cases of the greatest hardship, to reach the tribunal of appeal at all. That was inevitable. Of the 500 appeals to which he had referred, in 28½ per cent. of the cases there was no alteration. In little more than 10 per cent. the category in which the man had been placed was raised; in 60 per cent. of the cases the category was lowered, and in nearly 20 per cent. of that 60 per cent. not only was the category lowered but the man was either referred back or rejected altogether. In that "nearly 20 per cent." the man was in effect declared to be a person who ought not to have been sent into any category of any sort. Mr. Asquith went on to say he should be the last person that would cast any reflection on the members of the Royal Army Medical Corps. He knew what an admirable and well-qualified body they were, but in these matters it was important not only to have competence but to give confidence, and he thought it was desirable that, as far as possible, the presidents of these boards should be independent and private medical men.

Mr. Bonar Law, taking up the complaint as to the crush of persons waiting to be examined, said that as soon as it was discovered the War Office tried to deal with it, and he quoted a telegram sent to all centres throughout the country on May 12th. He denied that men who were specially excluded under the Act had been called up for examination, and quoted the printed notice sent to each man affected by the Act to show that it was open to men to fill up the certificate on the back, when their attendance for the reasons stated should not be required. Mr. Law went on to relate to the House the opinion that had been given to him by Dr. Galloway after an inspection of medical boards. It was as under:

> There must be errors made from time to time among the large number of decisions arrived at by these medical boards. There must be cases in which differences of temperament of the men under examination and of the medical examiners give rise to friction and cause for complaint. But on occasions too numerous to mention I have been a witness to the patience and courtesy shown by members of the medical boards in cases where these qualities have been subjected to severe trial.

Mr. Law added that he was not disposed in the smallest degree to speak on behalf of the Government in a spirit of apology. He was satisfied that at no time had any of the work of the War Office been done so conscientiously, and he doubted if it had been done more efficiently.

Mr. Herbert Nield, K.C., said that as chairman of an appeal tribunal during the last fifteen months his efforts had been directed to preventing the military getting men who were obviously unfit and whose destination was the hospital after a very short time.

Sir William Collins was not sure that attempts were not being made to obtain more at medical examinations than was possible. It was not necessary to justify the services, the heroism and the valour of the Royal Army Medical Corps. But medicine and surgery were at their best when doing what he regarded as their legitimate work rather than when they were pressed into the service of Acts such as this Review of Exceptions Act. Medicine flourished best in the atmosphere of free inquiry, and it appeared at its worst when it had to be forced into strict official method, and was dominated by military orders and instructions. It was absolutely impossible to expect something like a five minutes' examination, whether by one, two, or three medical men, to secure in any degree of certainty a satisfactory assurance that an individual was suffering either from any latent or patent disease, or to give guarantee that he would in the future be fit for general service—fit, that was to say, in many cases for a kind of activity totally different from that which he was doing in the past. The mere physical strain undertaken by a recruit when he joined very often was in itself the means of bringing out a physical weakness not previously ascertained, and the guarantee in the official military formula, "Fit for general military service," was one which he thought no medical authority would have suggested; it it was framed in language which scientific authorities would not justify. Sir William Collins said that in the instructions (No. 640) referred to by the Under Secretary for War there was a passage in regard to the certificates that Mr. Macpherson did not mention:

> Certificates granted by practitioners and consultants are to be carefully scrutinized, and lists are to be prepared showing the names of the doctors who, in any districts, grant large numbers of certificates. These lists are to be forwarded to the Secretary, War Office, from time to time, so that appropriate investigation may be undertaken as to the methods by which such certificates are obtained.

It was sometimes surprising that when a medical man, who was a civilian doctor, was taken, and told, on the authority of the War Office, that his opinion was almost sacrosanct, yet when as the family doctor of a patient he gave a certificate based upon his own particular knowledge of the case that was treated almost with contumely and disrespect. Sir William next referred to a possible explanation in regard to the passing at the present time of some previously rejected, namely, the change in the standard of fitness laid down. In September, 1915, instructions were issued which purported and were stated to be for the duration of the war, and the test of vision was laid down as $\frac{6}{24}$ in each eye without glasses. In May, 1916, another instruction was issued, and there had been a great deal of misunderstanding as to the previous instruction, which was not couched in clear language, but the order was repeated in the same form and emphasized. In February, 1917, the standard laid down in September, 1915, was cancelled, and a different standard of vision was set up, providing that if a man's vision is $\frac{6}{24}$ in one eye without glasses, and his right eye can be brought up to $\frac{6}{12}$ with glasses, he will be considered fit for category A. There should be greater security as to the composition of medical boards. The boards often had upon them in the provinces good medical men, but they were men who could not be expected to be universal specialists, and they were not to be expected to give opinions of a determining character as to the particular diseases, some of which were only ascertainable with the most careful investigation and research. There ought to have been greater opportunities of access to the special medical boards, and not only on the authority of the tribunals; if medical re-examination was to go on there ought to be greater opportunities for the medical boards, whether in the country or elsewhere, to have resort to the best obtainable medical service.

In the further debate, Sir Ryland Adkins gave his experiences as a member of an appeal tribunal that had decided 3,000 cases. One grievance felt very deeply in many parts of the country, he said, was that where a man was passed into the army B 3 or C 3 there was no guarantee that he would be left in those categories. He asked that there should be some rehearing by a tribunal or independent authority before a man was moved up into other

categories. He also urged the appointment of civilian doctors as chairmen. Mr. Sutton, one of the Labour members for Manchester, gave some melancholy cases of men whom he had seen at his own house after they had been passed into some category or other. He said that although the category was low, it was a disgrace that it should have been decided to take some of these men into the army. There were men who were practically paralysed all down one side and could not close one hand —they had been passed in C 3. He related other cases of a different kind which had come under his notice. Mr. Hogge insisted that men who could not be put in higher categories were being put in C 3 category to be examined when, how, and as often as the authorities pleased. Referring to another matter, Mr. Hogge said that a physician to the King Edward VII Sanatorium in Wales had reviewed 4,000 tuberculosis patients and had sent the names and results of the examination to the recruiting officer in that area. In spite of that, every one of the 4,000 men had been called up by registered letter to be examined under the Review of Exemptions Act. Mr. Snowden, while criticizing the operation of the Act, paid tribute to the prompt and courteous attention with which Mr. Macpherson had met his communications. The Under Secretary for War obtained reports for him in cases of alleged grievance, but in a great many cases he (Mr. Snowden) believed that those reports were without proper foundation. Mr. Needham spoke of complaints he had received from men who, going before a medical board, were told that their medical history sheets were of no use, as the cases were being gone over again. Mr. Montague Barlow referred to several of the cases taken at Hulme Town Hall; and Sir H. Elverston referred to certain other cases. Mr. Kiley also mentioned a number of distressing cases which had come under his notice. The various speakers, however, generally agreed that as a committee was to be set up these matters could most properly be brought before that body. Mr. Clem Edwards suggested that much of the indignation in the country was due to the fact that there were hundreds of thousands of young unmarried men who could be spared. Having spoken first of young unmarried men in munition works who, he held, were dispensable, Mr. Edwards referred to numbers of young unmarried men in the mines. He reckoned that there were 573,000 men of military age who were badged in the mines of this country. Of that number 157,835 were unmarried and under 25 years; 34,727 were unmarried and between 25 and 30; just over 8,000 up to the 32nd year were unmarried; and there were 5,200 under 41 unmarried. In East Glamorgan coalmines there were between 6,000 and 8,000 men who were working at other industries when the war began. He suggested that the Government should call for young unmarried men in batches. He was confident they would come in with alacrity, though they could not be got to volunteer individually, and he insisted that the conditions of coal-mining would admit of their being spared easily. In these circumstances, as already said, Mr. Pringle withdrew his motion.

The Select Committee is constituted as follows:

Mr. Shortt, K.C. (Newcastle-on-Tyne), Recorder of Sunderland, chairman.
Mr. Pringle (N.W. Lanarkshire), a barrister.
Sir Godfrey Baring, Bt. (Devon, Barnstaple), Chairman of the Isle of Wight County Council and Hampshire Appeal Tribunal.
Mr. Caradoc Rees (Carnarvon, Arfon).
Mr. Cochrane (South Shields).
Mr. Montague Barlow (Salford, South), a barrister and man of business.
Mr. H. Nield, K.C. (Ealing), Chairman of the Middlesex Tribunal.
Colonel Walter Faber (Hampshire, West).
Colonel J. Gretton (Rutland), Chairman, Bass's Brewery.
Mr. J. E. Sutton (Manchester, E.), Agent, Lancashire and Cheshire Miners' Association.
Mr. Hugh Law (Donegal, W.).
Mr. J. J. Mooney (Newry), barrister.

The reference to the Committee, as finally agreed upon on June 26th, is that it shall consider (1) the instructions issued by the War Office with regard to the administration of the Military Service (Review of Exceptions) Act, 1917; (2) the method, conduct, and general administration of medical examinations under the Military Service Acts, and to make recommendations.

The Committee at a preliminary meeting on June 27th decided to sit in public and to proceed very rapidly with its inquiry.

Casualties Among Medical Officers.—Mr. MacCallum Scott asked how many medical officers had been killed and wounded, respectively, since the commencement of the war. Mr. Macpherson: The numbers of Regular (including temporarily commissioned) and Territorial officers have been as follows:

Killed in action	137
Died of wounds	58
Died of disease	62
Wounded	707
	964

Figures for Colonial officers were not readily available.

R.A.M.C. Officers' Acting Rank.—Captain Wright asked why appropriate acting rank was given to officers of the Royal Army Medical Corps recently sent overseas with special territorial general hospitals, who were by special arrangement to serve for a minimum period of three months, and to be relieved when necessary, when similar appropriate acting rank had been refused to officers of the same corps occupying similar positions in territorial hospitals in France who had been serving in His Majesty's Forces before the war and continuously on mobilization, and in some cases for over two years at the front, and who were subject to no such special arrangements as to minimum period of service or relief? Mr. Macpherson replied that when a general hospital was mobilized at home appropriate rank was given to the superior officers of the unit, but it had been decided that acting promotions need not be given in the case of vacancies occurring in units serving abroad. The question of acting promotions in such cases was under consideration.

Medical Students.—Replying to Mr. MacCallum Scott, Mr. Herbert Lewis (the Parliamentary Secretary to the Board of Education) said that on June 21st the number of medical students in medical schools receiving grant from the Board of Education in 1913-14 and in 1916-17 were 3,483 and 1,981 respectively. The returns did not distinguish between men and women students. The figures did not include the medical schools at Oxford University, Guy's and Middlesex Hospitals, Bristol University, or the University Colleges of Nottingham, Reading, Southampton, and Cardiff, with regard to which the Board was unable to supply similar information. In reply to a further question, Mr. Munro said that the number of medical students attending Scottish universities before and during the war were as follows: In the year before the war 2,367 men and 236 women, in the present year 1,510 men and 696 women.

Nervous and Mental Disorders in Soldiers.—Mr. Macpherson informed Mr. King that Sir Robert Armstrong-Jones, late Medical Superintendent of Claybury Asylum, was employed as a consultant physician in cases of nervous and mental disorders among soldiers in the London district and Aldershot Command. He had no duties in connexion with ex-soldiers.

Soldiers Suffering from Mental Disorders.—In reply to a question, Mr. Barnes said that during the war certain classes of lunatic soldiers defined in an Army Council instruction are retained in the army. Broadly, those so treated were those whose mental trouble may have been produced by war strain. A soldier so retained was credited with his pay. In reply to a question by Sir George Toulmin, Mr. Barnes said that the cost of maintenance in the case of a discharged soldier under detention in an asylum was chargeable against his pension under the Lunacy Act of 1890 and the Royal Warrant of December, 1914. It had been arranged that a discharged disabled man should, while in an asylum, be treated on the footing of a private patient, his maintenance being paid for by the State. An extra payment of 3s. 9d. per week was made to the asylum authorities to enable them to provide suitable clothing and other amenities for the man, and 2s. 6d. was given to the man himself for personal comforts. Under Article 6 of the new Warrant and Order in Council, special provision was made for the maintenance of the family and dependants of a man whose disability was due to war service.

British Prisoners in Turkey.—Answering Mr. Brooks, Mr. J. Hope said he was afraid there was no doubt that while the British officers now in Turkish hands as a result of the surrender of Kut were, on the whole, well treated, the conditions of the other ranks was very far from satisfactory. The United States Embassy and Consulates in Turkey were able, before the rupture of relations between the United States and that country, to send considerable quantities of clothing and comforts to our prisoners. The Netherlands Minister, who was now in charge of our interests, fully realized the importance we attached to all possible steps being taken to improve the lot of our prisoners of war in Turkey.

Tetany.—Sir George Greenwood asked a long question with reference to experiments on animals performed by Professor Noel Paton and Dr. Leonard Findlay. Mr. Brace replied that certificates for the experiments were duly submitted, and Sir George Cave's predecessor, after consulting the Advisory Committee, decided not to disallow them. The purpose of the experiments was to investigate and, if possible, to ascertain the cause of the disease known as "tetany." He understood that the cost of the investigation was in part defrayed by the Medical Research Committee.

THE WAR.

THE WAR COLLECTION OF PATHOLOGICAL SPECIMENS AT THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

SINCE January, 1917, when two notices of this collection appeared in the JOURNAL,[1] the specimens on exhibition from the seat of war in France have been largely increased. In the first of the notices referred to the organization adopted for the collecting of the material was fully detailed, and, as was then stated, the duty of selecting from it such specimens as were of interest for permanent preservation was entrusted by the Council of the College to Mr. S. G. Shattock, F.R.S. (the Pathological Curator), with the assistance of Mr. C. F. Beadles (the Assistant Pathological Curator) and Captain Raymond Johnson. The chief part in the dissection of the specimens has fallen to Mr. C. F. Beadles.

It may fairly be said that at the present time the various forms of injury of the different viscera, with the exception of the brain, are amply, not to say exhaustively, displayed. In front of each of the specimens a printed description and brief history is placed, so that the whole of the material is available for examination and study.

Heart.

Amongst the specimens of the heart, are perforating wounds caused by missiles, and perforations of the pericardium with little or no injury to the heart itself. In some the missile is shown within one or other of the ventricles; in one, a shell fragment lies in the right ventricle without there being any perforation of the heart; the missile reached the auricle by the inferior vena cava in the neighbourhood of the liver, and thence passed through the auriculo-ventricular orifice into the ventricle, in the apex of which it now lies. Two specimens show results of cardiorrhaphy; in one, the missile was removed from the interior of the ventricle, death occurring four days later.[2] In the other case a superficial wound of the myocardium was sutured, and a branch of the coronary artery ligatured, the patient living twenty-four days afterwards.

Arteries and Veins.

Many additions to the injuries of the arteries and veins, and their results, immediate and remote, have been made—arterial haematoma, traumatic aneurysm, arterio-venous aneurysm, and aneurysmal varix. Indeed, every known lesion of this class is now represented in the collection.

In one instance the traumatic aneurysm (of the peroneal artery) was due to injury of the vessel by a splinter of the fractured fibula.

Two examples of rupture of the inner and middle coats, without rupture of the external, are contained amongst the series of artery specimens.

The specimens of injuries to the vascular system include three or more of perforations of the inferior vena cava; in one of these cases the patient survived for twenty-four hours.

Lungs.

Amongst the lungs are displayed examples of perforating injuries with their accompanying intra-alveolar haemorrhage, the lodgement of missiles in the organ, and the secondary results of haemothorax, and infective pleurisy with collapse of the lung from effusion—occurrences, of course, fully known and treated of in past and modern works on military surgery. In one or two, fragments of fractured rib and of clothing are impacted at the site of injury.

Abdominal Organs.

The perforations of the liver demonstrate the "explosive" effects of missiles at high velocity, and the comparatively slight effects produced by those at low; some show the local necrosis and bile staining about the site of injury.

The various forms of injury sustained by the kidney, stomach, and intestines are likewise fully represented.

In a certain number of instances the missiles causing the lesions are preserved with them, either *in situ* or separately, whether bullets or shell fragments or shrapnel.

[1] January 13th, p. 54, and January 20th, p. 97.
[2] Gray, BRITISH MEDICAL JOURNAL, 1915, ii, p. 561.

Results of Operations.

Besides the organs obtained after death, it is perhaps more pleasing to direct attention to a certain number which show the parts removed in successful operations. These include pieces of arteries excised in cases of arterial haematoma and traumatic aneurysm. In some instances a corresponding portion of the damaged vein has been removed with that of the artery, without the supervention of gangrene. To these must be added specimens of successful excision of extensive portions of the upper end of the humerus; of the scapula without the rest of the limb; of the kidney, the spleen, and of perforated portions of the small intestine, some of considerable length, for multiple perforations.

Method of Preparation.

All of these specimens have been prepared by the modern method—namely, the use of formol, followed by alcohol—and are mounted in 50 per cent. glycerin. They are thus shown in their natural colours, in most cases excellently preserved by reason of the use of a formol solution immediately after their removal, and the rapid transport of the material to the College.

For the prevention of rusting of steel fragments in the glycerin mixture, the device of Mr. Shattock has been adopted—namely, the addition, in small quantity, of a solution of crystalline sodium carbonate to the fluid.

Selection of Specimens.

In making this selection from a much larger number of specimens the object kept in view has been their scientific or educational value, and not a mere display of numbers. Morgagni's classical maxim, indeed, will always remain true: *Non numerendae sed perpendendae sunt observationes.*

Apart from gunshot injuries, excellent specimens are, moreover, on view, of gassed lung, illustrating the widespread oedema due to the rapid exudation from the capillaries into the alveoli. The action of the formol has in such circumstances coagulated the exudate before the organ was divided, a point necessary to bear in mind in studying the preparations.

Typical examples of the acute parenchymatous nephritis known as trench nephritis are also included amongst the conditions attendant upon modern warfare.

In conclusion, it should be added that there is in preparation for exhibition, and in part already displayed, a considerable collection of macerated bones illustrating fractures, which has been skilfully prepared at Cambridge, from cases in the 1st Eastern General Hospital.

The whole collection is open for inspection in the Museum of the Royal College of Surgeons from 10 a.m. to 6 p.m. (Saturdays 10 a.m. to 1 p.m.).

SOUTH AFRICAN WAR.

In the previous descriptive article (January 20th) it was said that only two specimens, both in the possession of the College, were obtained from the South African war. Dr. Lionel Sells (District Medical Officer, Uganda Medical Staff) calls attention to a third specimen prepared by himself from a case of amputation of the thigh performed by Major Fenwick at No. 2 General Hospital, Pretoria. This specimen is now in the Museum of St. Thomas's Hospital, London (No. 1126.) The fracture of the femur was caused by a Mauser bullet at close range; an unsuccessful attempt was made to save the limb, but five weeks after the injury amputation was found necessary.

"A DAY'S WORK."

CAVENDISH LECTURE BY CAPTAIN ANDREW MACPHAIL.

CAPTAIN ANDREW MACPHAIL, M.D., C.A.M.C., of McGill University, Montreal, delivered the Cavendish Lecture before the West London Medico-Chirurgical Society on June 22nd. He began by acknowledging his personal indebtedness to three previous lecturers—first, Sir Jonathan Hutchinson, who directed his steps towards the London Hospital, where he learnt the master truth that nothing pertaining to humanity is alien from the practice of medicine; next, Sir Frederick Treves, from whom he learned the purity of surgery; and, finally, Sir William Osler, who had given to medicine in the New World a fresh direction and an upward turn. For his own part, he had been concerned lately less with books and laboratories than with horses and men, and this must be his excuse for wandering outside the domain of science. But he would be bold enough to look even science in the face. We were at war, not only against

flesh and blood, but against principalities and powers, and one of these latter was the unmitigated scientific spirit of the enemy. The German worked in science as in war, throwing out saps underground, living and moving and having his being in darkness, whereas science with us was only a part of life and a development from it. The pursuit of science was the pursuit of truth, but the German cared nothing about the pursuit; he was all for the result, and thereby he had shut himself out from the world of imagination and had lost insight and sympathy. When all was said and done, we lived, not by truth, but by illusion, and the human heart created those illusions which alone made life tolerable. The human race had nourished itself, not upon science, but upon fiction, myth, and miracle, and still found its fulfilment, not in formulas, but in religion. Even to science the scientific spirit was fatal; it became dogmatic and then sterile.

For once, therefore, he would depart from the tradition of science which invested the Cavendish Lectures, and take instead a day's work in the field. The day he had chosen was last Easter Monday, when the Canadians, in the hardest bit of fighting they had had for two years, took Vimy Ridge. The task was set them in January and performed in April. By a piece of good fortune it fell to his division to act at the point of the spear. No verbal description could make intelligible all the events of that day; it must be left to the artist by an infinity of small touches to create a picture of what really took place on that great cliff, shaped like a dog's hind leg, from whence the Canadians drove the enemy into what once was the sea bottom in the space of 468 minutes according to schedule. It was not easy to visualize an army division, one of the finest creations of human genius. Every man on the 300 or so acres which a division occupied was made to feel that he himself was carrying on the war; and so he was, for if he failed he jeopardized the entire army. The burrowed area was mysterious enough at first, but a man got to know it, even as a worm knew its own cheese, and the underground plan was easier to follow than were some of the streets of London. The medical arrangements for the day had all to be made and rehearsed according to plan. No one system suited all engagements, and a system must be designed to make good in the case of defeat as well as in the case of victory. Accordingly two months were spent in excavating underground posts, shoring up roofs and walls, and fitting the place with racks for stretchers; and nearly all this work was done by the medical personnel under the supervision of a sapper.

Captain Macphail then followed the progress of a wounded man from the field. After the preliminary attention from the regimental medical orderlies, the man was sent to the first-aid post under the charge of the regimental bearers, who had their advanced head quarters two hundred yards from the parapet. Here careful dressings were applied by the medical officer, and then by means of hand or wheeled stretchers the wounded man was taken to a dressing station a mile or perhaps two miles in the rear, where all the dressings were examined and, if necessary, renewed. From this point he was taken still further back by motor ambulance, and at the main dressing station the casualties were taken over by the R.A.M.C. convoy.

Of the wounded themselves in detail little was seen at the front; they were only seen in the mass as they were sent on their way. It was first possible to see them in detail at the base or in England, and then to estimate the wreck of war and the pity of it. By 6 o'clock on the dawn of that bleak Easter Monday the wounded were coming in; by 7 the prisoners were marching down in companies; by 8 the supply trains were going up; and by 9 the whole world was alive with men and horses and motors, and the very roads were spewing up their stony entrails. All was over by 2 in the afternoon, and before darkness fell the field was clear. So rapid was the evacuation from the front that cases began to accumulate at the advanced dressing station, where the men lay in fifties and hundreds, well protected by blankets, by the side of the road, and the newly fallen snow covered them. A general who happened to pass by thought that this was due to the breakdown of the medical service, until it was explained to him that the cause was really the expeditiousness of those arrangements, and that otherwise the men would have been lying on the field itself. By midnight all the cases had been cleared from the casualty clearing station at head quarters, and the ambulance trains were on their way to London. At the later battle of Messines Ridge, which began at midnight, the ambulance trains were rumbling over Charing Cross bridge by two o'clock on the following afternoon.

The medical service, Captain Macphail continued, was no longer an ancillary but was an integral part of the army. This was so much the case that the Red Cross no longer availed to protect. He had never seen a deliberate instance of the Red Cross being violated on either side; on the contrary, the enemy had withheld his fire intentionally, but, conditions being what they were, hospitals and ambulances had often been struck. Such a day's work as he had described was looked upon somewhat as an interruption of the regular medical service, for they had millions of men to keep in a state of health and to care for in sickness. The methods of sanitation and hospitalization, including a mobile laboratory always available for the exact diagnosis of difficult cases, and extreme care in segregation, had yielded an amazingly healthy army. He had not seen a single case of typhoid at the front, and the few infectious cases that had to be dealt with were like children's diseases—such as chicken-pox and mumps—which the men would have gone through in childhood had it not been for modern developments in sanitation. It was an army, too, largely without venereal disease. That disease was regarded as a self-inflicted wound, like maiming the hand to escape service. To conceal it was a crime. The infected man was handed over to the assistant provost marshal, and the source of the contagion was discovered and deported. New problems in dealing with disease arose continually. Trench fever was a puzzle at first—men came complaining of great pain in the shins; it was put down as myalgia, and he was afraid injustice was done.

In conclusion, Captain Macphail said that care must be taken not to underrate the enemy's powers of resistance or of adaptation. That morning at Vimy they were close upon the German heels, and in a German dug-out they discovered sides of bacon, abundant bread, potatoes, bottled waters, drugs, dressings, articles in new leather, a phonograph, and a copy of Kant!—not at all bad supplies to make war on. The prisoners were helpful and diligent and docile, but had a certain faith in ultimate success. He advised the people at home to close their eyes to the end; to look upon the war as a normal condition, to cease praying for peace, to cease brooding over the continuation of hostilities. Otherwise they would get what the French called "psychopathy of barbed wire." No ground whatever existed now for alarm or doubt; the end was sure, but the days had shortened and lengthened thrice since the war began, and he rather thought they would shorten and lengthen again, perhaps more than once, before that end was reached.

TETANUS IN HOME MILITARY HOSPITALS.

In the JOURNAL of November 11th, 1916, was printed a memorandum on the prophylaxis, diagnosis and treatment of tetanus, compiled by the War Office Committee for the Study of Tetanus, of which Surgeon-General Sir David Bruce is chairman. In this the curative treatment by antitoxin was discussed, and the method of performing intrathecal injection described.

Analysis of Results.

We have now received from Sir David Bruce an analysis of cases of tetanus treated in home military hospitals during August, September, and part of October, 1916, in continuation of the two previous analyses compiled for earlier periods. In the first analysis there were 231 cases, with a mortality of 57.7 per cent.; in the second analysis 195 cases, with a mortality of 49.2 per cent. The present analysis deals with 200 cases; of these, 127 recovered and 73 died, giving a mortality of 36.5 per cent. Thus there has been a regular and satisfactory fall in the mortality rate, which it is hoped will continue until the 20 per cent. aimed at is attained. This fall is attributed to the introduction of the primary prophylactic injection of antitoxin given to every wounded man in the front area, also to the earlier diagnosis and earlier specific treatment of the disease. If the fall continues, says Sir David Bruce, it will depend upon the introduction of multiple prophylactic

doses, the vigilance of nursing sisters in detecting early symptoms, and the prompt and thorough treatment by medical officers by means of antitoxin. The original intention was to publish analyses of the cases of tetanus treated in home hospitals at the end of each year of the war; now, however, owing to the great interest taken in the subject by the medical officers concerned, it has been decided to report briefly in future on each series of 100 cases as they are completed.

During the same period two analyses have been published by Colonel Sir William Leishman of the cases of tetanus occurring among the British troops in France. In the first, 179 cases were dealt with, showing a case mortality of 78.2 per cent.; in the second, 160 cases were analysed jointly with Major Smallman, showing a case mortality of 72.7 per cent. It is to be noted that the cases dealt with in France are in the nature of things more acute and severe than the cases which arise in England.

Sir David Bruce illustrates his analysis by diagrams showing the monthly totals of cases, and the relation between the number of days elapsing between date of wound and onset of symptoms, and the rate of mortality; the last named shows clearly that the longer the interval the lower is the death-rate. A curve is given showing the number of cases which occurred on each day after the day of wound; the shortest incubation period was three days, and the longest 365. More cases occurred on the ninth, eleventh, and fourteenth days than on any other. At the beginning of last November the Tetanus Committee recommended that second, third, or more prophylactic injections should be given, and the hope is expressed that medical officers in charge of wounded will give this a fair trial. It would be interesting to note the effect upon the incubation period.

Among the 200 cases under review, 102 were noted as having received a prophylactic injection of antitoxin in France immediately after being wounded; of these, 74 recovered—mortality 27.3 per cent. Among the other cases there was no record of a prophylactic dose in 87, though most of them probably received it; of these, 48 recovered—mortality 44.8 per cent. The remaining 11 cases were stated to have had no prophylactic injection of any kind; of these, 5 recovered—mortality 54.5 per cent. The average incubation period in these 11 cases was 15.7 days. This is just over half the average incubation period of those inoculated on the day of wound.

Treatment by Antitetanic Serum.

With regard to therapeutic or curative, as opposed to prophylactic treatment, all but two of the 200 cases received antitetanic serum after the onset of symptoms; with 127 recoveries, and mortality 35.8 per cent. The two cases which, for some unexplained reason, did not receive curative serum, died.

A table showing the influence of the route in the therapeutic injection of serum suggests that the intrathecal method, contrary to the inference drawn from the figures for 1915, shows no advantage over the other routes. The question is then asked, Is there any other evidence to be found in the most recent records to show that the intrathecal route is preferable to the other methods of injection? and the answer seems inconclusive. Again, analysis of the figures relating to dosage furnishes no useful deduction as to the influence of this factor on the curative action of serum. The new figures, in fact, as Sir David Bruce points out, show no advance in knowledge of the curative value of antitoxin. He discusses the whole matter in a cautious and judicial spirit. The number of cases analysed was small, there were only two controls, and there was the greatest variety in the mode of treatment and in coincident infections, while deaths were often wrongly credited to tetanus. Hence it is not surprising that the evidence as to the real curative value of serum is so far inconclusive. Fortunately there is no shadow of doubt as to the prophylactic value of antitoxin.

In the present unsettled state of the evidence as to the therapeutic use of serum, Sir David Bruce feels that the only thing to do is to redouble efforts to make its application as thorough as possible. In the opinion of the Tetanus Committee, this can be best done by recognition of early symptoms and by prompt and thorough intrathecal injections.

General Lines of Treatment.

In conclusion, Sir David Bruce repeats the general advice as to treatment given in his previous analysis:

(*a*) Place in a quiet darkened room under the care of a sympathetic and capable nurse. "Rest, sleep, and food" are looked upon as the first essentials of treatment.

(*b*) If thorough surgical treatment is carried out on wounds from the beginning, so as not to allow the presence of necrotic tissues or foreign bodies, the number of cases of tetanus should sensibly diminish, if not altogether disappear. But, if a case does occur, then the wound should not be actively interfered with until the tetanic symptoms have subsided.

(*c*) The intrathecal injection of large doses of antitoxin of high potency, if available, should be begun at once and supplemented by intramuscular and subcutaneous injections.

(*d*) In addition, if necessary, the patient should receive sedatives, of which morphine in ¼-grain doses and administered every four hours is perhaps the most suitable. Chloral, chloretone, and other sedatives are also given by the mouth or rectum.

CASUALTIES IN THE MEDICAL SERVICES.

ARMY.

Lost at Sea.

LIEUTENANT R. STEWART, R.A.M.C.

The *Scotsman* of June 21st reports the death by drowning of Lieutenant Ronald Stewart, R.A.M.C. He was educated at Kelvinside Academy and at Glasgow University, where he graduated M.B. and Ch.B. in 1914. After filling the posts of resident assistant at the Western Infirmary, Glasgow, and of senior medical officer of the Belvedere Fever Hospital, Glasgow, he took a temporary commission as lieutenant in the R.A.M.C., and had served for some time at No. 4 General Hospital, Stobhill. Apparently he was the medical officer lost in the *Arcadian* on April 25th, whose name was then given as W. Stewart. Obituary notices of the other medical officers then lost appeared in the BRITISH MEDICAL JOURNAL of May 12th.

Killed in Action.

CAPTAIN C. A. WHITTINGHAM, R.A.M.C.

Captain Clive Alan Whittingham, R.A.M.C., was reported as killed in action, in the casualty list published on June 21st. He was educated at Glasgow University, where he graduated M.B. and Ch.B., with commendation, in 1910. He entered the Special Reserve of the R.A.M.C. as a lieutenant on January 31st, 1914, joined for duty as soon as qualified, and had recently been promoted to captain. He was attached to the Royal Fusiliers when killed.

Surgeon Probationer R. F. Pratt, R.N.V.R.

Died on Service.

MAJOR J. L. JONES, R.A.M.C.

Major John Langdale Jones, R.A.M.C., died of cerebral malaria at Nowshera, in the Punjab, on May 14th, aged 40. He was born on December 29th, 1876, educated in the Medical School of the Royal College of Surgeons, Ireland, in Dublin, and took the double qualification of the Irish Colleges in 1899. Entering the R.A.M.C. as lieutenant on November 29th, 1900, he became captain on November 29th, 1903, and major on November 29th, 1912.

CAPTAIN J. NELIGAN, R.A.M.C.

Captain John Neligan, R.A.M.C., was reported as having died on service, in the casualty list published on June 23rd. He graduated as M.B., B.Ch., and B.A.O. in the National University of Ireland in 1915, and immediately afterwards took a temporary commission in the R.A.M.C.

Wounded.

Captain C. W. Armstrong, R.A.M.C. (temporary).
Captain A. C. Court, R.A.M.C.(S.R.).
Captain C. D. Coyle, R.A.M.C. (temporary).
Captain G. S. Glass, R.A.M.C.(T.F.).
Captain R. O. H. Jones, R.A.M.C. (temporary).
Captain E. R. Mackay, Australian A.M.C.
Captain S. K. McKee, R.A.M.C. (temporary).
Captain C. G. L. Patch, R.A.M.C. (temporary).
Captain N. Prior, New Zealand Medical Corps.
Captain C. M. Samson, Australian A.M.C.
Captain R. P. Smith, R.A.M.C. (temporary).

Captain J. G. Sweeney, Australian A.M.C.
Captain E. B. Thomas, Australian A.M.C.
Captain G. W. Watson, R.A.M.C.(S.R.).
Captain C. A. Webster, R.A.M.C.(T.F.).
Captain R. C. Winn, Australian A.M.C.

DEATHS AMONG SONS OF MEDICAL MEN.

Grace, Mervyn Bruce, Lieutenant 2/6th North Staffordshire Regiment, killed in France on May 8th. He was the fourth son of the late Dr. E. M. Grace, of Thornbury, Gloucestershire. He was shot through the head whilst leading an attack after being wounded in the arm.

Green, Charles Leyton, Second Lieutenant Essex Regiment, elder son of Dr. Green, of Woodside, London, S.E., killed June 9th, aged 23. His commission was dated November 24th, 1914.

Herron, Reginald Maurice, Second Lieutenant, eldest son of the late Dr. James Herron, died of wounds on June 12th, aged 31.

Jardine, Graham Brynmer, Second Lieutenant Argyll and Sutherland Highlanders, attached to the Cameron Highlanders, elder son of Dr. Robert Jardine, of Glasgow, reported missing on October 18th, 1916, now presumed killed on that date, aged 24 years. He was educated in the Glasgow Academy, of which he was dux in 1908. In 1912 he graduated M.A. (honours in Classics) in Glasgow University, being first in his year. In 1915 he took the Honours B.A. in Classics in Oxford. No trace of him has been found since he led his platoon in the attack on the German trench near the Butte of Warlencourt at 3.30 a.m. on October 18th, 1916.

[We shall be indebted to relatives of those who are killed in action or die in the war for information which will enable us to make these notes as complete and accurate as possible.]

NOTES.

FRENCH HONOURS FOR MEDICAL WOMEN.

THE Medal of Honour for Epidemics was presented by the President of the French Republic, through the Minister for War, on June 17th, to members of the staff of the Hôpital Auxiliaire 301 (Scottish Women's Hospital), Royaumont. The medal in gold was received by Miss Ivens, M.B., M.S. (chirurgien-chef); and in enamel by Miss R. Nicholson, M.B., B.S., Mrs. J. A. Berry, M.B., Miss W. Ross, M.B., Ch.B., and Miss M. Wilson, M.B., Ch.B. (surgeons); by Mrs. Savill, M.B., Ch.B. (radiologist); and Miss E. Courtauld, L.S.A. (anaesthetist).

MEDICAL OFFICER'S GIFTS TO THE RED CROSS.

Major W. Napier Keefer, of Toronto, late I.M.S., recently made a large gift of money to the King with a request that His Majesty should apply it as he deemed most suitable. Out of this gift, at the King's request, the Joint War Committee of the British Red Cross Society and the Order of St. John has allotted £7,500 as follows:

£2,000 to the Star and Garter Home for Paralysed Soldiers, for the permanent endowment of a room; £2,000 to the Nurse Cavell Homes of Rest, for the permanent endowment of a room; £1,000 to the Auxiliary Hospitals for Officers Department, for the Pinewood Sanatorium for Tuberculosis Officers; £500 to the Prisoners of War Central Fund; £2,000 to the Orthopaedic Curative and Training Fund, to be applied as follows: £1,000 to the Military Orthopaedic Hospital, Dublin, and £1,000 to the Ulster Volunteer Orthopaedic Hospital, Belfast.

In addition the King has handed £2,000 to Sir Walter Lawrence to be used for the benefit of any scheme that may be approved for the treatment of soldiers and sailors suffering from deafness.

The donor, Surgeon-Major William Napier Keefer, was a member of the Bengal Medical Service, from which he retired nearly thirty years ago. He is a Canadian, and was educated at Toronto University, where he graduated B.A. in 1864, and at McGill University, Montreal, where he graduated M.D. and C.M. in 1869; he took the L.R.C.S.Ed. and the L.S.A. in the same year. He entered the I.M.S. on October 1st, 1869, and retired on December 18th, 1889. He was for many years medical officer of the 13th Bengal Lancers (Duke of Connaught's or Watson's Horse), and afterwards Chief Medical Officer of the Andaman Islands. He saw much war service in India—the Lushai expedition on the N.E. frontier in 1871–72, medal with clasp; the Daphla expedition in Assam in 1874–5, mentioned in dispatches; the Jowaki campaign on the N.W. frontier in 1877–78, clasp; the Afghan war of 1878–80, mentioned in dispatches, medal with clasp; and Egypt, 1882, actions of Kassassin and Tel-el-Kebir, medal, Khedive's bronze star, and Order of the Osmanieh.

England and Wales.

DR. GLYNN OF LIVERPOOL.

A SPECIAL meeting of the Liverpool Medical Institution took place on June 20th to do honour to Dr. Thomas R. Glynn on the occasion of his attaining his jubilee year of membership. The President, Dr. Charles J. Macalister, occupied the chair, and on the platform were Drs. Caton, Macfie Campbell, Mr. Frank T. Paul, all past presidents, and the General Secretary (*pro tem.*), Dr. Frank H. Barendt. Ladies were present, and the attendance of members, under the present stress of war, was remarkably good. Many apologies for unavoidable absence and expressions of good-will and warm congratulations from members, old pupils, and friends of Dr. Glynn were received. The Secretary read extracts of letters received from the Right Honourable the Lord Mayor of Liverpool, Sir William Forwood, Bt., an old schoolfellow of Dr. Glynn, Sir Dyce Duckworth, and Sir Thomas Barlow, testifying to the merit and personal worth of Dr. Glynn.

Dr. Charles J. Macalister said that in congratulating Dr. Glynn on his fifty years of membership the members were really congratulating themselves in having an old friend whom they one and all delighted to honour. Dr. Glynn was a veteran professor of medicine, a veteran leader of the profession, and one whose skill had been valued by medical men and students and by the public of Liverpool and far beyond. Largely through the medium of the Liverpool Medical Institution collating the scientific work of the School of Medicine, now the Medical Faculty of the University, and of the large hospitals of the city and environs, Dr. Glynn's professional ability was early recognized. His work had been of high scientific merit, great originality, and a stimulus to the innumerable students he had so assiduously instructed. His influence among the rising and already risen members of the profession was an invaluable heritage. It was because the medical profession far and wide knew the solid work that Dr. Glynn had performed, the enthusiasm which he brought to bear in his daily duties, the example of conscientious attention to detail he had ever set before it, that the members and his many friends had assembled to show their delight and pleasure in offering to Dr. Glynn their hearty congratulations. Dr. Caton then proposed the following resolution:

> The members of the Liverpool Medical Institution accord to Professor Thomas Robinson Glynn their hearty congratulations on his completion of fifty years of membership of the Institution.
>
> As Professor of Medicine in the University of Liverpool for nearly thirty-five years and as Physician to the Liverpool Royal Infirmary, Dr. Glynn has been in the foremost rank of those who have advanced the science and practice of medicine. His teaching has influenced the work of numerous students and practitioners, and by his unwearied devotion to his profession he has conferred invaluable benefits upon the sick and suffering of the community.
>
> As a member of Council, secretary to ordinary meetings, vice-president, president and trustee, Dr. Glynn's services to the Institution have been inestimable, and these members desire to place on record their gratitude for, and sense of appreciation of, his work, which has done so much to maintain the high traditions of the Liverpool Medical Institution and of the profession in the city. They express the hope that he may have many years of happiness with the gratification of being able to look back upon a life's work which has been continuous, effective, and appreciated by his patients and in the councils of his profession.

Dr. Caton said that he had known Dr. Glynn for forty-eight years, had been his colleague at the Royal Infirmary, and had been associated with him in many social gatherings where Dr. Glynn and others met at one another's houses for the purpose of studying music, art, Shakespeare, and other great dramatists. These studies favoured the development of beneficial hobbies. Dr. Glynn, always fond of nature, developed his artistic powers in landscape painting to a degree rarely found in an amateur. In music he sought recreation from the arduous and anxious labours of an energetic life; he sang and played the organ well to the delight of his friends. Dr. Glynn's health and perennial enthusiasm was largely due to the fact that he thoroughly recreated himself by these forms of refreshment and complete change of occupation. Dr. Caton concluded by bearing testimony to Dr. Glynn's gifts as a clinical teacher, and the services he had always rendered to the Medical Faculty of the University.

Mr. Frank T. Paul seconded the resolution. He was reminiscent of the circumstances under which their friendship was formed some forty-two years ago. Both being keenly interested in morbid anatomy and histology, it was only natural that they were thrown much together. Dr. Glynn's faculty for using the paint brush was exemplified in the numerous life-size paintings of various diseases of the thoracic organs. Mr. Paul spoke of the enthusiasm with which Dr. Glynn always worked, his thirst for knowledge, his anxiety to correct, if necessary, his diagnosis by the *post-mortem* findings. As a friend to young medical men and senior students, Dr. Glynn never seemed to forget that he was once a young man. His sense of humour was always hovering about ready to be roused, and the mistakes of others were ever indulgently glossed over, especially where youth was implicated. In public matters Dr. Glynn did not intrude; possibly had he done so his services to scientific medicine would have been more fully recognized.

Dr. Macfie Campbell contributed some remarks upon Dr. Glynn's helpfulness as a consultant. His diagnostic acumen was characteristic, his judgement sound, and the harmony between medical attendant and patient was at all times preserved. His optimism and cheery manner were typical. The resolution was then put to the meeting and carried unanimously, with prolonged applause.

Dr. Glynn, in his reply, said that the task of congratulating a friend was more easy than to acknowledge the compliments so liberally bestowed upon him adorned with so many superlatives. He truly appreciated the kind thoughts written and expressed by the members of the institution, and he would remember the occasion as an outstanding event in what he must conclude to be a long life. What success in life he had had he attributed to three factors—good health, good luck, good wife and friends. Disappointments did not necessarily remain such, for he called to mind one of the earliest he experienced. Although holding M.B.Lond. and M.R.C.S. and L.R.C.P., he failed to secure the post of resident medical officer at the Liverpool Royal Infirmary because he was not an L.S.A. At that time the School of Medicine was growing, and the infirmary, anxious to retain him, gave Dr. Glynn the post of demonstrator of anatomy. It was this circumstance that was decisive in his career, and he remained in Liverpool. In his student days great stress was laid on careful physical examination of patients, which he thought was nowadays apt to be relegated to the background owing to the influence of bacteriology and newer methods of biochemistry. He witnessed the introduction of the thermometer, 18 inches long, with no recording index, and the necessary haste in noting the exact temperature before the column of mercury receded. Pasteur's researches and Lister's practical application of these, the birth of the germ doctrine of disease, were rapidly passed in review. Dr. Glynn alluded to consultants of former years, and expressed the opinion that a medical man should always recreate himself by some diversion which should give him complete change from his daily duties. He concluded by acknowledging with sincere gratitude their congratulations.

CENTRAL MIDWIVES BOARD.

Special meetings of the Central Midwives Board were held on June 19th and 20th, at both of which Sir Francis Champneys presided. Nine women were struck off the roll. As usual there were many cases of ignorance with regard to taking the temperature and pulse and general breaches of the rules, but there were fewer charges of neglect of ophthalmia and only one with regard to puerperal fever. An unusual case was that of a midwife who obtained burial of three infants whilst giving a certificate implying that the box contained the body of a stillborn child. A fee of 2s. 6d. was paid by the parents of this child, whilst the midwife pocketed 15s. paid by the parents of the other two infants.

At the monthly meeting, on June 21st, Sir Francis Champneys in the chair, letters were read from the Privy Council, stating that the Treasury was prepared to authorize the payment, from public funds, to the country members of the Board, of the difference between their former and their present first class railway fares when attending Board meetings in London, the claims for repayment to be submitted to the Privy Council on December 1st in each year. A letter was read from the general secretary of the Medical Defence Union, asking the Board to consider certain communications of a more or less threatening nature received by several members of the union, from county medical officers of health as executive officers of the local supervising authorities, in respect of professional attendance upon midwifery cases, where uncertified women were engaged. It was agreed to reply that the Central Midwives Board had no jurisdiction over medical practitioners, uncertified women, or local supervising authorities, the authority possessing jurisdiction in the case of medical practitioners being the General Medical Council, which had drawn a distinction between such women acting as monthly nurses and those acting as midwives. An uncertified woman who "habitually and for gain" attended women in child-birth otherwise than under the direction of a registered medical practitioner was liable under the first section of the Act to a fine not exceeding £10, cases of genuine emergency excepted. It was decided that the chairman should arrange for the inspection, from time to time, of all training schools for pupil midwives conducted by midwives approved by the Board for the purpose.

OXFORD ORTHOPAEDIC CENTRE.

At a meeting of the Union Society, Oxford, presided over by the Earl of Jersey, to arouse interest in the provision of carpentering, engineering, and other workshops for wounded soldiers, Sir William Osler gave a most lucid account of the aims and objects of military orthopaedics, and the need for curative workshops as part of the therapeutic outfit of an orthopaedic centre. Colonel Sir Robert Jones, Inspector of Military Orthopaedics, and Major Goldthwait, of the American orthopaedic unit, also spoke. King Manuel was able to say that the curative workshops already installed at other centres had produced better results than could have been hoped. It seems probable that Oxford will become one of the most important military orthopaedic centres in the country, for in addition to an orthopaedic hospital and curative workshops for wounded men, there is being established at Headington an orthopaedic centre for officers which will accommodate 100, and be capable of extension.

Ireland.

THE IRISH MEDICAL PROFESSION AND THE WAR.

SINCE the outbreak of the war the Irish medical profession has voluntarily supplied a large proportion of its members for the medical services of the army and navy. The proportion of Irish doctors who have joined the medical services is much higher than would appear from a casual glance of the number of doctors who are registered with Irish addresses. Whilst over 3,000 doctors are usually registered with Irish addresses it is very doubtful whether, even in times of peace, the number engaged in all classes of Irish medical practice ever reached 2,000. It is generally estimated that only one in six newly qualified Irish doctors commences practice in Ireland. The great majority go to England and Wales and a smaller number go to the colonies.

Owing to the number of doctors who have accepted temporary commissions in the R.A.M.C., there are many rural districts in Ireland depending upon one doctor to look after the health of 6,000 or 8,000 of the population, and it is believed that even if military service were made compulsory on the profession in Ireland, the number of doctors joining the medical services could not be very much increased beyond that now obtained voluntarily.

The members of the Irish profession who have remained at home because they are over military age, or for other reasons, have given very valuable help in treating wounded soldiers in the general hospitals, or in V.A.D. hospitals specially organized for the reception and treatment of wounded soldiers. The War Office accepted last April a long-standing offer from the medical profession in Dublin to staff a base hospital for France. The doctors who will form the staff of this hospital will work in relays of nine for a term of three months, and will consist of three surgeons, two physicians, an ophthalmologist, a pathologist, a radiographer, and an anaesthetist. Similar offers have been made by the profession in Belfast and

Cork, but, so far, they have not been accepted by the War Office.

The Irish Medical War Committee was formed at a meeting of the profession convened by the Leinster Branch of the British Medical Association in May, 1915. It consists of two representatives of each of the various licensing bodies and medical schools in Ireland. Among its chief duties are (1) to provide doctors for the army and navy, (2) to protect the interests, during their absence, of those doctors who join the medical services and to assist them in finding suitable substitutes, (3) to advise regarding the medical requirements of the civil population. Public bodies, such as boards of guardians, have, with very few exceptions, given facilities to their medical officers who desired to apply for commissions in the medical services. They have not only given them the necessary leave, but in most cases have agreed to pay half their salaries during their absence as well as to pay the full salaries of their locumtenents. It is, however, to be regretted that some boards of guardians have persisted, contrary to the advice of the Irish Medical War Committee and the ruling of the Local Government Board, in appointing, as locumtenents, doctors of military age, when it was open to them to appoint doctors who were not available for military service.

Correspondence.

THE CO-ORDINATION OF BRITISH MEDICAL POLICY.

SIR,—In three letters already published I have ventured to urge—

1. The absolute necessity of *adequate liberty* for English medicine, if her advance is to continue, and the limitation of such control as may be inevitable to *adequately educated control.*

2. The careful consideration of a system of *part-time State service* for such sections of the profession as seem inevitably fated to have their liberty limited—except, of course, such services as the Army Medical and Navy Medical Administrations and the Public Health Service, all of which should obviously be whole-time State services.

3. That the *British Medical Association* is our only available fighting defensive force, but that, to avoid fresh failure, it needs prompt and drastic reforms, which I have indicated.

I would now urge our need to insist upon our absolute right, in view of our present all-absorbing work for the country, not to be coerced, whilst so deprived of normal resisting power, into any half-considered legislative changes.

We must have time—time for the return to civil life of the thousands of our most active and most interested members from military duty—time to think out and to weigh every proposal made (there must be no Prussian methods used this time), and to decide what is best for the empire—time to reorganize our deliberative assembly, to make it representative of all branches of the profession. Then if we show ourselves collectively unworthy of our traditions and our trust (the trust being the health of the empire), if we weigh sixpences against national needs, we shall at least do so deliberately, and under decent conditions of fair play from the public.

If, on the other hand, as I hope and believe, the experiences of this war have taught us that there are wiser policies than that of "hand to mouth," we may construct for English medicine the nearest possible approach to an ideal relation to the State, and, by ensuring the utmost degree of liberty for it, ensure also the utmost possibilities of usefulness and honour. We must have time; also we must waste none.—I am, etc.,

Exeter, June, 25th. W. GORDON.

SIR,—Many interesting and forceful letters on this subject have lately appeared in the JOURNAL, which I hope, after further discussion, will result in a definite policy being agreed upon by panel practitioners. Having been in general practice over thirty years, may I state my conviction that the fundamental condition of a satisfactory medical service, panel or otherwise, is adequate remuneration? The present payment by panel patients scarcely provides a basis for negotiation; we should never have attempted to supply the required service on such impossible terms. I have in round numbers 350 panel patients, for which I receive about £100 a year. Out of this sum I am called upon to provide a furnished consulting room and waiting room, involving rates and taxes, heating and lighting, with the necessary attendant to answer the door, take messages, and keep the room in order. I doubt if it would be possible to secure this in the town for £50 a year. Then one must have a conveyance of some sort, a proportionate charge for which would probably be underestimated at £20 a year; a further sum of £10 for the clerical work entailed would not be too generous. These charges leave £20 a year as remuneration for my professional services. How can one be content to continue such an arrangement? The doctor feels the injustice keenly and knows that he is exploited. At present rates of remuneration many general practitioners have to devote a considerable amount of time to book-keeping, bill posting, dispensing, care of instruments, etc.; all these minor but necessary duties could with advantage be handed over to a surgery attendant, if the money was sufficient to provide one; the practitioner would then have more time to devote to the care of his patients, the record of cases, and some needful relaxation. Lord Alverstone in his *Recollections* says:

> The position of barristers' clerks is anomalous and interesting. They are paid by the clients by fees of half a crown for a consultation, and 5 per cent. on the brief fees. I know of no other instance where the personal attendant on a professional man is paid indirectly by the clients.

I wonder how the barrister himself would like to do their work! Unhappily, we are not so well represented in Parliament as are the lawyers. Compare the work, responsibility, remuneration, and out-of-pocket expenses of a revising barrister with that of a district Poor Law medical officer, or the salary and duties of a county court judge with that of the average county M.O.H. While I cordially dislike the word trade unionism, and also strikes, we must remember that they have been evolved by necessity, have proved effective weapons, and that they succeed in getting things done. No one as yet has devised equally powerful but less obnoxious measures.

My salary as Poor Law medical officer has remained the same for more than ten years, but had there been a strike, and an arbitrator appointed, who could doubt that an appreciable increase would have been awarded, and declared as justified by the increased cost of living, and of drugs which I have to provide?

My experience convinces me that panel patients themselves would not be slow to realize the necessity for a new order of things, with regard to payment for medical services. The difficulty in the past has mainly been with the agitators, who so often misrepresent and mislead them.

In the days of the old club system several societies accumulated millions of money by sweated labour of doctors and so-called paid officials, while the sick pay was at too low a rate. If they had been reorganized and contributions exacted from the members proportionate to the rise in wages, my belief is that ample funds would have been provided for an efficient medical service if properly administered.

Could the Poor Law medical service have been overhauled and brought up to date at the same time there would have been no need, I think, for the Insurance Act; but that has now, I suppose, come to stay, and it is up to us, by strikes (in the restricted sense as defined by Dr. Noy Scott) or otherwise, to see that the medical service is provided with adequate funds to make it efficient and desirable for all concerned.

The British Medical Association must get a move on and adopt more vigorous methods to obtain proper remuneration for the panel practitioners. Its failure to secure this in the past, and its slow appreciation of the urgency of the matter, account for the growing demand for a new organization with a bolder policy. I am all for reformation, not revolution, and I earnestly hope the Association will rise to the occasion and act quickly, for time presses.

Just lately I have read the first circular issued by the British Medical Association on "the work of the British Medical Association for insurance practitioners," and

I would like to ask the Committee one question, and press for a reply. Is the wage limit now properly enforced and adhered to?—I am, etc.,

June 19th. SENIOR.

SIR,—How comforting it must be to the officials of the British Medical Association to know that the Association is still regarded by your correspondents as the "hope of the profession in its future struggles." With regard to the Secretary, surely it is an advantage to have a medical man in this post, as he can grasp the effect of proposed legislation upon the profession as a whole. We all realize the danger of a Medical Secretary who is primarily a politician and secondly a medical man.

I am among those who regret the absence of scientific papers at the meetings of Divisions, but even when scientific matters were discussed the attendance at meetings was very small. Fortunately, we have in Bedford a medical society which fills this gap.

We members of the Association *are* the Association, and what the majority wills will be done. At the root of all our troubles is the apathy of the profession. It is not the fault of the Association that medico-political problems form most of the pabulum of our Divisions. If all medical practitioners had the interests of the profession at heart, we should have full meetings, and any decision arrived at would be the considered opinion of the Division. Experience shows that a few enthusiastic members constantly attend meetings, and in return for their trouble apathetic members describe them as "an interested clique, who run the Division." The only remedy is for each enthusiast to inspire other members with his zeal, and as progress in this direction is made many misunderstandings will be cleared up.

The old cry, as false as it is persistent, still rankles in the mind of many that the Association sold us during the Insurance Act *débâcle*. The Association drew up a pledge which we agreed to keep. We broke our pledge by joining the panel, and so stultified ourselves and let down the Association. We may appoint as many new and brilliant officials as we like, but if the rank and file are dull and indifferent to their best interest, of what avail will it be?—I am, etc.,

Bedford, June 23rd. S. J. ROSS.

SIR,—Of the many letters on the above subject, surely special praise is deserved by that of Mr. Frank Coke, F.R.C.S. (June 16th, page 823). He outlines a very practical scheme of organization, which includes a strong local combination of practitioners as well as a central body to co-ordinate and be the mouthpiece of the smaller bodies. Organization is the crying need of the profession for to-day and more specially for to-morrow, but it seems to me that what we also want is a better conceit of ourselves. The profession does not appear to have yet recovered the moral lost in the great stampede, and has altogether too low an opinion of its importance to the State, and it is at this valuation of ourselves that we are judged by others. Nothing but this will account for the cavalier way in which the profession is treated by State-appointed committees of laymen, by boards of guardians, and by municipal and county bodies all over the country.

That the medical profession is greater than its present estimation of itself is shown by the following lines from a dedication by Robert Louis Stevenson:

> There are men and classes of men that stand above the common herd: the soldier, the sailor, and the shepherd not unfrequently; the artist rarely; rarelier still the clergyman; the physician almost as a rule. He is the flower (such as it is) of our civilization; and when that stage of man is done with, and only remembered to be marvelled at in history, he will be thought to have shared as little as any in the defects of the period, and most notably exhibited the virtues of the race.

No one word of this splendid eulogy would be made less true if we possessed a strong business organization on modern lines for the maintenance of our prestige as a profession, and for our protection from State exploitation as individuals.—I am, etc.,

June 20th. ORGANIZER.

QUO VADIS?

SIR,—I think Dr. Fred. J. Smith is not quite fair to the "weaker brethren" in the profession when he attributes the defeat of the policy of the British Medical Association to the extra remuneration of a million and a half which tempted them beyond their strength. Surely the weaker brethren showed clearer foresight than the stalwarts.

If the avowed and official policy of the Association was its real policy, if work under the Insurance Act was derogatory to the honour and interests of the profession, how came it that our secretary was advised to take office as a commissioner; that meeting after meeting was held all over the country to form committees (local medical, panel, etc.) with various officials to carry out the provisions of the Act? Surely no man with common sense could doubt that with all these preparations we intended to work the Act. If work under the Insurance Act was derogatory, why did the Association bargain for better financial terms? And to-day why are referees and consultants and hospitals and infirmaries all ready to come into line and extend the provisions of the Insurance Act? A protest is invariably met by the rejoinder that the thing is inevitable. And so with a money bribe with our weaker brethren. With a fatalism worthy of a better cause we are drifting more and more under the Insurance Act which the avowed and official policy of the British Medical Association declared to be derogatory to the honour and interests of the profession.—I am, etc.,

Exeter, June 23rd. J. A. W. PEREIRA.

MINISTRY OF HEALTH.

SIR,—I am filled with amazement to read that it is seriously proposed that we medical men should consider and debate certain regulations affecting in a marked degree our practices, and suggested by the new Ministry of Health.

Is the British Medical Association in earnest when it asks us to do this? I cannot believe it possible that an Association said to have the interests of the general practitioner at heart should, at a time like this, call meetings for such an object.

At the present time medical men may be divided into two chief classes:

(1) Men at home.
(2) Men on active service.

The majority of the men at home are doing their own practices, the practices of their colleagues on active service, and part-time military work as well; and yet, in spite of all this extra strain, we are asked, as if we were being asked to lunch, to weigh and consider and report upon proposals which, if carried through, will have more far-reaching results than any proposal ever yet placed before the profession.

The Association must know that we have not the time to give these proposals that consideration they ought to have. It would be impossible by any other way than a referendum to get the opinions of all the men, for after days of such strain as those through which we are now passing, the majority of us are neither physically nor mentally fit to attend meetings.

Again, for men at home calmly to sit down and dispose of the future of 10,000 of their colleagues who are absent, and therefore unable to have a voice in the matter, is monstrous—it is iniquitous! Surely, it is our plain duty to refuse in no uncertain voice to discuss anything of this nature till the absent men have had time to return and pull their practices together again.—I am, etc.,

Newcastle-on-Tyne, June 25th. E. F. PRATT.

THE SHORTAGE OF MEDICAL OFFICERS: POSSIBILITY OF RELIEF FROM INDIA.

SIR.—Cannot the authorities at home insist on the Indian Government relaxing its grip upon the spare medical officers out here? The Indian Government will of course reply that there are no medical officers to spare, but if Lord Derby knew that experienced surgeons who have been recalled to military duty from civil appointments are being wasted in looking after Indian regiments in cantonments, doing the work that they did twenty years ago—if Lord Derby knew of this, I do not think he

would hesitate to compel the Indian Government to send to Europe a large proportion of the surgeons recalled from civil employment during the war. Many retired I.M.S. officers have actually been dragged out from private practices at home to fritter away their time in India in some unimportant work, instead of being sent to France or to some duty in the United Kingdom to release other men for the front. Most of us are longing to bear our share of the strain in France, but all requests to be sent to Europe meet with the reply that the work we are doing here is "just as important," or some equally inept platitude.

Of course any superficial inquiry will elicit the stereotyped answer from India that they cannot give up any of their surgeons, but those of us who see things as they are know that in this time of dearth of medical officers at home upwards of 100 experienced surgeons at least could be shipped to Europe in the next three weeks. All that I would suggest is that the Home Government should order the transfer of all I.M.S. officers recalled from civil employ during the war and at present serving in cantonments in India to England at once, and I guarantee that substitutes would be forthcoming to do the work they are doing now. If the Indian Government is first asked whether these men can be sent, the usual juggling with figures will follow, and nothing will be done.—I am, etc.,

May 30th. WASTED.

THE GRIEVANCES OF TERRITORIAL MEDICAL OFFICERS.

SIR,—In reply to "Territorial Force" (p. 857), let me say that I think since the commencement of the war there have been no examinations held by which majors who "qualified" could be selected for promotion to lieut.-colonels. Many, however, have been promoted without examination. I believe fifteen years is the period of service qualifying for promotion to lieut.-colonel, so that an officer who had nine years' service when war broke out would, if each year of embodied service counted two, be eligible for promotion next August. To make each year of war service count two towards gratuity at the end of the war would not equalize the present discrepancy between the pay of the Territorial and temporary officer, but would be a rough-and-ready way of reducing the unfairness of the present rate. I have to-day seen a Territorial Force R.A.M.C. captain who has eleven years' service, two spent abroad in the present war, and I have in this brigade a temporary lieutenant R.A.M.C. of three months' service, whose pay is 6s. 6d. a day more than the Territorial captain's!—I am, etc.,

June 26th. O. C.

ANTHRAX IN UGANDA.

SIR,—I have read with interest Dr. Spearman's memorandum on anthrax in Uganda (June 16th, p. 809), but it seems to me that Dr. Spearman has missed the point of the case. It is, he says, "noteworthy for its rarity," being possibly the first case reported in the Protectorate. This great rarity will probably be found to be due to want of recognition; but this by the way. What Dr. Spearman should have commented upon are certain unusual features of the case. In the first place, there is its duration—namely, ten days, whereas internal anthrax generally runs its course in three to five days. The alleged discovery of anthrax bacilli in the sputum is also far from common. At the *post-mortem* examination grey hepatization was noted, and, more remarkable still, small caseating masses. Though I have seen some thirty cases of pulmonary anthrax I have never observed similar changes, and cannot recollect to have heard or read of them.

But the case is remarkable also for what has *not* been noted. Thus, no mention is made of the peculiar terminal stage of collapse with which all who have seen much of anthrax are familiar; and the *post-mortem* record is silent regarding any gelatinous deposit in the anterior mediastinum, which I have never yet missed in pulmonary anthrax. Dr. Spearman states that "the bronchial glands were considerably enlarged"—nothing more, whereas I have invariably found them infiltrated with blood. Lastly, I note that anthrax bacilli are said to have been found microscopically in films taken from the broken-down patches in the lung, but we are not informed whether they were found in other parts of the lungs, and, curiously enough, they were not found in the spleen. It is unfortunate that no cultures appear to have been made, for the case is so unusual in every respect—both clinical and pathological—that in the absence of cultural confirmation of the diagnosis the utmost scepticism is justified.—I am, etc.,

Bradford, June 19th. F. W. EURICH.

DERMATITIS FROM EXPLOSIVES USED IN THE AIR RAID.

SIR,—Yesterday, Tuesday, June 26th, 1917, I saw at the London Hospital fourteen cases of severe dermatitis due to contact with powder from bombs dropped in the East End of London on Wednesday, the 13th inst. The majority of the patients were workpeople handling materials which had been impregnated with dust from the explosive. In two cases the feet were affected through irritant matter in the streets. In one case simply handling powder picked up was the cause. The characters of the eruption were exactly similar in all the cases. On the hands, the palms and fingers were stained a deep orange colour, and the inflamed area was covered with closely set vesicles, in some instances confluent. The condition reminded one of a severe pompholyx. The hands were very swollen, and movement was impaired. The patients complained of intense burning and irritation. A point of special interest is that the vesicular dermatitis began in nearly every instance on the ninth day after the first contact with the powder. I hope to describe the progress of the cases in detail, but venture to send this note as a warning that it is dangerous to handle the powder or any material impregnated with the powder. In some of the patients the condition is already septic.—I am, etc.,

JAMES H. SEQUEIRA,
London, W., June 27th. Physician, Skin Department, London Hospital, etc.

The Services.

EXCHANGE.

WOULD officer on home service care to exchange with officer in base hospital, France?—Address No. 2150, BRITISH MEDICAL JOURNAL Office, 429, Strand, W.C.

Universities and Colleges.

UNIVERSITY OF EDINBURGH.

AT a meeting of the University Court on June 20th a letter was read from Dr. John Thomson, resigning the office of lecturer on diseases of children, to take effect in October next, and Dr. J. S. Fowler, now in Salonica, was appointed in his place. At the same meeting agreement was expressed with the report of the conference between representatives of the faculties of medicine and science of the Scottish universities with reference to the Carnegie research appointments.

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—*J. G. Allan, L. G. Allan, R. Andrew, J. S. Bow, Sarah Boyd, W. W. Brown, W. D. Brunton, J. C. Burns, W. E. Canekeratne, Ba Than Chain, Fakir Chand, Pares Chandra Datta, T. S. Duncan, H. B. Dykes, P. B. Eaton, W. Everett, N. P. R. Galloway, J. B. Kirk, J. L. Lamont, D. M'Eachran, Annie M. Mackay, W. D. Mackinnon, D. W. M'Lean, *R. Mailer, A. R. Matheson, R. A. Nathaniel, R. D. Osler, A. van der Poel, F. W. Poole, H. B. Renton, S. S. Rosebery, A. O. Ross, J. Schneider, J. M'I. H. Smellie, G. L. M Smith, J. O. P. Smith, Janet Smith, J. H. R. Smith, S. L. Smith, A. Strachan, J. M. Tyrrell, L. Walker, W. A. Weatherhead, J. D. White, J. Wolfson, A. T. Woodward.

* With distinction.

UNIVERSITY OF GLASGOW.

THE degree of D.Sc. Public Health was conferred upon Dr. Ernest Watt on June 25th, the title of his thesis being "A study of some aspects of the tuberculosis problem in Scotland."

VICTORIA UNIVERSITY OF MANCHESTER.

MR. W. H. PARKINSON has passed the M.D. examination with commendation.

SOCIETY OF APOTHECARIES OF LONDON.

THE diploma of the society has been granted to Messrs. W. A. Bibby, J. Hollings, C. de C. W. Langdon, and C. A. Mortlock-Brown.

Obituary.

LIEUT.-COLONEL FREDERICK WILLIAM HENRY DAVIE HARRIS, R.A.M.C. (retired), died at Addlestone on June 20th, aged 59. He was born on January 25th, 1858, educated at University College, London, and took the diplomas of M.R.C.S. in 1880 and L.S.A. in 1882. After filling the posts of house-surgeon of the West Kent General Hospital at Maidstone and of the Teignmouth Infirmary, and of assistant medical officer of the Suffolk County Asylum, he entered the army as surgeon on May 30th, 1885, becoming surgeon-major on May 30th, 1897, and lieut.-colonel on May 30th, 1905, and retiring on July 19th, 1905. He acted for some time as adjutant of the R.A.M.C. at Aldershot. He served in the South African war (1899–1902), taking part in operations in Cape Colony and receiving the King's and Queen's medals, each with two clasps. He was formerly a member of the Naval and Military Committee of the British Medical Association and at one time represented the Army Medical Service on the Central Council. He was an honorary associate of the Order of St. John of Jerusalem, and was secretary of the R.A.M.C. Fund and Benevolent Society. He rejoined the R.A.M.C. for duty on August 25th, 1914, and at the time of his death was medical officer of the Army Clothing Factory. He leaves a widow and two sons, both of whom are in the army.

DR. JOHN WALTERS, who died on May 11th, was born in October, 1836, and was educated at King's College, where he won the gold medal and scholarship for surgery and honours in medicine and midwifery. He took the diploma of M.R.C.S.Eng. in 1857, and graduated M.B.Lond. in 1858. After holding the posts of house-surgeon at King's College Hospital and assistant demonstrator of anatomy at King's College he studied in Paris, and on returning to London became private assistant to the late Sir W. Bowman. He afterwards entered the Army Medical Service, and was sent out to Canada at the end of 1861 at the time of the Trent affair, being attached to the 2nd Battalion of the 17th Regiment. After spending some months at Halifax he was appointed assistant surgeon to the Rifle Brigade at Hamilton, Ontario, and while there married Mary Allan Geddes, the youngest daughter of Dean Geddes, then rector of Hamilton. After leaving the army he settled in practice at Reigate in the then firm of Martin, Holman, Hallowes, and Walters, where he remained until December 31st, 1908, when, being senior partner, he retired after over forty-four years' service. He was one of the founders of the Reigate and Redhill Cottage Hospital (now the Reigate and Redhill Hospital), and was its senior consulting medical officer. He was also for many years surgeon to the Children's Home, Reigate, had been a member of the Reigate Town Council, and was a borough magistrate for many years. His first wife died in 1899, and in 1902 he married Miss Eva Harrison, a daughter of the late vicar of Reigate, who survives him. He had eight children by his first marriage, of whom seven survive—four sons and three daughters—his second son, Dr. Alexander R. Walters, being now the head of the medical practice with which he was associated for so many years.

DR. HENRY CAMPBELL, of Cardiff, died on June 19th, after an illness of a few hours' duration, aged 49. He was born at Newton Crumlin, near Ballymena, co. Antrim, and received his medical education at Queen's Colleges, Galway and Belfast, and at the University of Edinburgh. He took the diplomas of L.R.C.P. and S.Edin., and L.F.P.S.Glas. in 1893, and the degree of M.D.Durh. in 1908. After acting as assistant to Dr. Parry of Pontycymmer for two years he started practice on his own account in Canton, Cardiff, and was joined as partner four years ago by his younger brother, Dr. F. W. Campbell, who is at present serving as captain R.A.M.C. He was a member of the Cardiff Division of the British Medical Association, in which he took great interest, and was one of the five practitioners appointed by the profession to deal with the problem of selecting medical men for the requirements of the army. He also took an active part in the committees established in connexion with the administration of the Insurance Acts. He leaves a widow and five children.

Medical News.

MAJOR ALEXANDER FARQUHARSON, M.D., B.Sc., R.A.M.C., of the Middle Temple, and Major Hugh Neville Adam, M.D., F.R.C.S., L.R.C.P., R.A.M.C., of Gray's Inn, have been called to the bar.

THE Council of the University of Leeds has conferred upon Colonel de Burgh Birch, C.B., late professor of physiology and Dean of the Faculty of Medicine, the title of Emeritus Professor.

THE President of the Board of Education, the Right Hon. H. A. L. Fisher, M.P., will deliver an address to the scholars, medallists, and prizemen of University College, London, at the college, on Thursday next, July 5th, at 3 p.m.

THE fourth meeting of the Conjoint Board of Scientific Societies was held on June 13th at the Royal Society, with Sir J. J. Thomson, P.R.S., in the chair. The report of the Executive Committee for the past half-year showed that a number of questions of scientific and industrial importance have come before the board. Among these are the need for an anthropological survey of the British people, the maintenance of the international catalogue of scientific literature, and the desirability or otherwise of adopting the metric system throughout the British Isles.

SIR GEORGE BEATSON, Chairman of the Scottish Branch of the British Red Cross Society, has written two pamphlets for that branch. The first, entitled "The Story of the Red Cross and its use in War as a Distinctive Emblem," gives a brief account of the origin of the movement for the recognition of the use of civilian medical assistance in a campaign, does justice to Henri Dunant of Geneva, and sets out the main provisions of the Geneva Convention, which it was hoped would be observed by all belligerent countries until it was flagrantly violated by Germany. The Red Cross emblem is derived from the Swiss Federal flag—a white cross on a red ground—by reversing the colours. The second pamphlet describes how the disabled wounded soldier is treated at orthopaedic centres in Scotland, and, in particular, the curative methods at the Scottish National Red Cross Hospital, Bellahouston. The pamphlet is well illustrated by a reproduction of photographs of the operating room, the pool bath, the whirlpool bath, the massage room, the electrical room, and the radiant heat room during working hours.

ON June 5th the Röntgen Society devoted a third consecutive meeting to discussing the future of the British *x*-ray industry, and agreed to a resolution appointing a committee to act in an advisory capacity with a view to determining in what particular directions the society could best further the interests of the manufacturers. Captain Robert Knox, in reopening the discussion, said that there were three principal reasons for the failure of the British *x*-ray industry to hold its own in the past: (1) Lack of capital; (2) want of co-operation; (3) failure to employ highly technical men to carry out contracts. The steps to be taken in the future should include a closer co-operation between the physicist and technical expert and practising radiologist; and also the amalgamation of existing businesses into one large corporation. A school of British radiology had always existed, and only required stimulating. Lieut.-Colonel Robert Wilson, of the Canadian Army Medical Corps, said that British workers had been content to make discoveries and then allow other countries to exploit them. They had been weak, not so far as scientific initiative was concerned, but in the application of it to industry.

OWING to the advantages likely to result from obtaining a continuous record, from year to year, of the state of the atmosphere as regards suspended impurity, the Committee for the Investigation of Atmospheric Pollution has been constituted an Advisory Committee on Atmospheric Pollution to the Meteorological Office, and a grant of £500 has been allotted by the Department of Scientific and Industrial Research to cover the cost of the work for the current year. The grant is intended to defray the expenditure of the Advisory Committee only, and was given on the understanding that the cost of gauges, collection, and analyses should be borne by the authorities which co-operate by setting up observing stations. The collection, compilation, and publication of statistics on the suspended impurities of the air is of service in connexion with the study of problems relating to fuel economy and smoke prevention, as well as agriculture, health, and the preservation of buildings. Information as to method of working, with standardized instructions and blank forms for returns, can be obtained from the honorary secretary, Dr. J. S. Owens, 47, Victoria Street, London, S.W.1.

Letters, Notes, and Answers.

THE telegraphic addresses of the BRITISH MEDICAL ASSOCIATION and JOURNAL are: (1) EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand London*; telephone, 2631, Gerrard. (2) FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand London*; telephone, 2630, Gerrard. (3) MEDICAL SECRETARY, *Medisecra, Westrand London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

The address of the Central Medical War Committee for England and Wales is 429, Strand, London, W.C.2; that of the Reference Committee of the Royal Colleges in London is the Examination Hall, 8, Queen Square, Bloomsbury, W.C.1; and that of the Scottish Medical Service Emergency Committee is Royal College of Physicians, Edinburgh.

QUERIES.

G. F. N. (Sherbourne Greystones, co. Wicklow) wishes to hear of places suitable for a lady who has just recovered from a nervous breakdown. Healthy situation and light outdoor employment desirable. Moderate terms.

INCOME TAX.

INQUIRER says that he is told by the collector that as his partner's army pay is paid into the firm's account the special army rate of taxation is thereby lost.

*** This should not be so. The privilege of paying tax at the army rate is not affected by the destination of the pay. Further, army pay is assessed to income tax by the War Office acting through the army pay agents—Messrs. Holt and Co., presumably—and is not liable to local assessment. If it has in any particular case been paid into the firm's account, it should be excluded from the firm's general profits for purposes of assessment, and shown separately on the service member's return. The division of the local charge between the partners will, of course, require an appropriate modification.

R.A.M.C. has recently taken a commission, and inquires as to the operation of the three years' average basis of assessment in his new circumstances.

*** He is assessable in the ordinary way, but is entitled to have that assessment adjusted to the actual amount of his income. We therefore suggest that his return should be made on the basis of an estimate of current year's income (this should be specified) through his army agents. If and when he receives a notice of assessment from the local assessing authority, he should write to the surveyor of taxes, stating that he joined the R.A.M.C. on May 7th, 1917, and that he "applies" under Section 13 of the Finance Act, 1914 (Section 2) to have the assessment adjusted to the actual income of the year. It would be advisable at the same time to state the facts as fully as the circumstances allow, and to ask that any payment of duty be deferred until the financial year has ended, and a definite statement can be made as to the income for that year.

ANSWERS.

REMOVAL OF TATTOO MARKS.

INVESTIGATOR inquires: How can deep tattoo marks and pictures on the wrist and back of forearms of a woman be best removed without any bad scarring? The best treatment, according to the experience of one distinguished dermatologist, is to soften the epidermis with an ointment of salicylic acid and tannic acid, to break the granules of ink by the aid of electrolysis, and to apply hydrogen peroxide. The whole process, he admitted, however, is tedious and the result not highly satisfactory. A French prison surgeon (see JOURNAL, 1906, i, p. 1382) treats the tattoo mark with a concentrated solution of tannin, needles the part very closely, and rubs over the punctures a stick of silver nitrate. A few minutes later the caustic solution is wiped off. The blackened tattooed area becomes an eschar which separates, leaving a superficial scar. This treatment, described as "not very painful," is quite unsuited, however, to deep and wide tattoo marks. Professor Dubreuilh (*Annales de Dermatologie*, etc., fourth series, vol. x, 1909, p. 367) enters very fully into the subject; he considers *x* rays useless, and the destruction of the coloured tissues, after methods such as are described above, are open to objection. Dubreuilh practises a method which consists in dissecting off the superficial layers of the dermis as deeply as is desired. He then practises Thiersch's method of skin grafting, applying to the fresh bleeding surface long broad strips of skin which include part of the cutis vera as well as the epidermis.

LETTERS, NOTES, ETC.

COCAINE PRESCRIPTIONS AND PENALTIES.

MEDICAL practitioners in general, and panel practitioners in particular, should, for their personal benefit, note the following details of a prosecution which lately took place at Leeds under one of the many sections of the Defence of the Realm Act.

Dr. Henry Pope, medical practitioner, and Albert Rothstein, pharmacist, were summoned before the stipendiary, the former for having given to a patient a prescription for a lotion containing cocaine, and the latter for supplying the patient with the same, contrary to the provisions of the Act, on three separate occasions. The regulations provide that any medical practitioner giving a prescription for the supply of cocaine must date the prescription and sign it with his full name, address, and qualifications, and in addition mark it with the words "Not to be repeated." So far the prescriber. The chemist must not supply it without marking the prescription with his name, address, and date of dispensing, and must not repeat the prescription without authority. Further, the transaction is to be entered by the chemist with various particulars in a special book set apart for this purpose, which book shall be open to the inspection of an authorized person. The evidence made it clear that a technical offence had been committed inadvertently both by the prescribing practitioner and the dispensing chemist, and a fine of 10s. on each of the three summonses was imposed upon each defendant.

The defence of the practitioner was in the hands of Mr. Willey, instructed by Messrs. Hempson, the solicitors of the Medical Defence Union. Mr. Willey pointed out that by regulations made under the National Insurance Act a special prescription book had to be used by panel practitioners, and that other regulations required that the name of the practitioner should be written on the form, and that the prescription should not be repeated without a fresh order duly signed. Dr. Pope, in dealing with a panel patient, carried out the requirements of the Act under which he was then prescribing, forgetting for the time the later emergency Order made under the Defence of the Realm Act. The real object of the Cocaine Order was to identify the prescriber, the patient for whom the drug was prescribed, and to prevent any self-repetition. All these requirements were carried out by Dr. Pope, and it was quite obvious that the necessary caution was observed in the spirit, if not actually in the letter.

The magistrate decided that he ought to impose a small penalty, because the defendants should have made themselves familiar with the regulations, though he added that, as a matter of fact, he could not see how any harm could have been done in the present case.

BULLET WOUND IN PREGNANT UTERUS: RECOVERY.

DR. CLEMENT BELCHER writes: During the recent hostilities in Northern France two officers were billeted at a small farmhouse with a peasant woman. They occupied a room on the ground floor, on the same level as the living room of the family, the two rooms being divided by a thin partition. One morning one of the officers was engaged in cleaning his revolver, and revolved the barrels one by one to do so. Unfortunately, to his great horror and surprise, one of the barrels was undischarged; the bullet pierced the partition, and struck the woman upon the other side in the kitchen, who at the time was stooping with her buttocks directed towards the partition. The woman, who was far advanced in pregnancy, was removed to a hospital, where it was found that the bullet had entered just outside the anus. The woman was put to bed, and in a few hours was fairly comfortable and remained so for three days, until labour pains came on; she had a fairly good labour, but the child was born dead, with a bullet wound in its head; when the skull was opened the bullet was found inside the brain. The bullet had passed through the gluteal muscles, the floor of the pelvis of the mother, the wall of the uterus, and the skull of the child, when its force was expended; had it gone further, it would have assuredly entered the woman's peritoneal cavity with disastrous results. The woman made an uneventful recovery, and returned to her farm within a short time of her confinement.

STATE MEDICAL SERVICE.

DR. S. NOY SCOTT (Plymstock) writes: I wonder if many of the advocates of a State Medical Service have seen and pondered over the significance of the remark made by Sir William Collins in the House of Commons debate on June 21st. He said "that medicine and surgery appeared in their worst aspect when pressed into service under Acts such as the Review of Exceptions Act and when dominated by military orders and instructions." "Orders and instructions"—though not always called military—generally have a force which is military in character, and especially so when issued by Commissioners who are specifically given bureaucratic powers.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Seven lines and under	0	5	0
Each additional line	0	0	8
A whole column	3	10	0
A page	10	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.

THE

British Medical Journal.

THE JOURNAL OF THE BRITISH MEDICAL ASSOCIATION.

EPITOME

OF

Current Medical Literature.

JANUARY TO JUNE, 1917.

London:

PRINTED AND PUBLISHED AT THE OFFICE OF THE BRITISH MEDICAL ASSOCIATION,
429, STRAND, W.C.

INDEX TO THE EPITOME FOR VOLUME I, 1917.

READERS in search of a particular subject will find it useful to bear in mind that the references are in several cases distributed under two or more separate but nearly synonymous headings—such, for instance, as Brain and Cerebral; Heart and Cardiac; Liver and Hepatic; Renal and Kidney; Cancer and Carcinoma, Epithelioma, Malignant Disease, New Growth, Sarcoma, etc.; Child and Infant; Bronchocele, Goitre, and Thyroid; Diabetes, Glycosuria and Sugar; Eye, Ophthalmia, and Vision, etc.

The Figures in this Index refer to the Number of the Paragraph, NOT the Page.

A.

Abdomen, gunshot wounds of (E. Liek), 27
Abscess, gas, of the brain (Emmanuel Rychlik), 17
Aërial torpedoes, wounds from (G. Kelemen), 40
Air passages, effects of asphyxiating gases on (G. Bilancioni), 12
ALBEE, Fred. H.: Bone surgery, 7
Anaesthesia, infiltration (H. H. Schmidt), 19
ANGLADE: Histology of the brain after gunshot, 57
Antiseptic, selection of (Philipowicz), 37
Aphonia, war (G. Liébault), 2
Arteries, late opening of, in projectile wounds (Raymond Grégoire), 21
ASCOLI, V.: Migrations of projectiles in the circulation, 38
Asphyxiating gas. *See* Gas

B.

Bacillus pyocyaneus infection (Kenneth Taylor), 8
BAEHR, G.: Immunization against typhus fever, 11
BERGALONNE: Soap as a dressing for wounds, 18
BERRY, Martin: *X*-ray appearances in gas gangrene, 33
BILANCIONI, G.: Effects of asphyxiating gases on the air passages, 12
BINET: Cardiac rhythm in the fighting soldier, 5
BLUM, Edgard: Simulation of disease, 47
Bone surgery (Fred. H. Albee), 7
Bone transplantation in injuries of skull (Albert E. Morison), 49
Brain, gas abscess of (Emmanuel Rychlik), 17
Brain, histology of, after gunshot (Anglade and de Teyssieu), 57
Brain and spinal cord, projectile lesions of (G. Mingazzini), 1
Brain wounds, meningitis after (Hart), 55
Bullet, shrapnel, wanderings of in the circulation (A. Grandgérard), 20

C.

Cardiac overstrain in soldiers (C. Lian), 4
Cardiac rhythm in the fighting soldier (Binet), 5
CARRACCIO, Mariano: Simulation of skin disease by soldiers, 26
CHASSEVANT: Treatment of "gassing," 42
Cholera vibrios, fermentation reaction as an aid in rapid diagnosis of (Gaehtgens), 45
Circulation, wanderings of a shrapnel bullet in (A. Grandgérard), 20—Migrations of projectiles in (V. Ascoli), 38—(H. H. M. Lyle), 39—Wanderings of projectiles in the veins (Achille Monti), 44
Conjunctivitis, simulated (G. Sbordone), 48
Cranial surgery at dressing stations (Leroy), 16

D.

Delivery through shell wound (Saint, Goelinger, and Poiré), 22
DE NAPOLI, F.: Simulation of skin disease by soldiers, 25
DESJARDINS, A. U.: Wounds in the present war, 29
DE TEYSSIEU: Histology of the brain after gunshot, 57
Diplococcus lanceolatus as a cause of suppuration in compound fractures (Trambusti), 58.
Disease, simulation of. *See* Simulation
Dressing stations, cranial surgery at (Leroy), 16

E.

Ear, middle, lesions from aërial commotion (A. Saupiquet), 31
EASTMAN, Joseph Rilus: Treatment of infected gunshot wounds, 50
Electrargol in epididymitis (Mario Giordiano), 23
Electrolysis in open suppurating wounds (Charles Russ), 54
Epididymitis, electrargol in (Mario Giordiano), 23

F.

Femoral artery and vein divided by projectile without bleeding (Jumon), 9
Fermentation reactions as an aid in the rapid diagnosis of *V. cholerae* (Gaehtgens), 45
Fever, typhus, immunization against (H. Plotz, P. K. Olitsky, and G. Baehr), 11
FIBRICH, Richard: Gunshot wounds of the stomach, 28—Gunshot wounds of head, 41
Foreign bodies in the pleura, localization of (S. Gangi), 35
Fracture, compound, *Diplococcus lanceolatus* as a cause of suppuration in (Trambusti), 58

G.

GAEHTGENS: Fermentation reactions as an aid in the rapid diagnosis of *V. cholerae*, 45
GANGI, S.: Localization of foreign bodies in the pleura, 35
Gas abscess of the brain (Emmanuel Rychlik), 17
Gas, asphyxiating, effects of on the air passages (G. Bilancioni), 12
Gas gangrene, *x*-ray appearances in (Agnes Savill), 32—(Martin Berry), 33
Gas in the tissues, diagnosis of (Vilvandré), 10
Gases, asphyxiating, extemporized protectives against (Lomonaco), 43
"Gassing," treatment of (Chassevant), 42
GILBERTI, Pietro: Projectiles in the heart, 52
GIORDIANO, Mario: Electrargol in epididymitis, 23
GOELINGER: Delivery through shell wound, 22
GRANDGÉRARD, A.: Wanderings of a shrapnel bullet in the circulation, 20
GRÉGOIRE, Raymond: Late opening of arteries in projectile wounds, 21
Gunshot injury of the third cervical nerve, operation for neuralgia of (v. Hofmeister), 15
Gunshot wounds of abdomen (E. Liek), 27
Gunshot wounds of head (Richard Fibrich), 41
Gunshot wounds, infected, treatment of (Joseph Rilus Eastman), 50
Gunshot wounds of peripheral nerves (Captain Byron Stookey), 6
Gunshot wounds of stomach (R. Fibrich), 28

H.

HART: Meningitis after brain wounds, 55
Head, gunshot wounds of (Richard Fibrich), 41
Heart, nervous, symptoms of (Kurt Singer), 24
Heart, projectiles in (Pietro Gilberti), 52—(Silvan), 53
Heliotherapy of wounds (Magrassi), 56
HOFMEISTER, V.: Operation for neuralgia of the third cervical nerve from gunshot injury, 15

I.

Infiltration anaesthesia. *See* Anaesthesia

J.

JUMON: Division of femoral artery and vein by a projectile without bleeding, 9

K.

KELEMEN, G.: Wounds from aërial torpedoes, 40

L.

LEROY: Cranial surgery at dressing stations, 16
LIAN, C.: Cardiac overstrain in soldiers, 4
LIÉBAULT, G.: War aphonia, 2
LIEK, E.: Gunshot wounds of abdomen, 27
LOMONACO: Extemporized protectives against asphyxiating gases, 43
LYLE, H. H. M.: Migrations of a projectile in the circulation, 39

M.

MAGRASSI: Heliotherapy of wounds, 56
Malingering. *See* Simulation
Meningitis after brain wounds (Hart), 55
Middle ear. *See* Ear
MINGAZZINI, G.: Projectile lesions of brain and spinal cord, 1
MONTI, Achille: Wanderings of projectiles in the veins, 44.
MORISON, Albert E.: Transplantation of bone in injuries of skull, 49

N.

Nerves, peripheral, gunshot wounds of (Captain Byron Stookey), 6
Nervous heart. *See* Heart

Neuralgia of the third cervical nerve from gunshot injury, operation for (v. Hofmeister), 15

O.

OLITSKY, P. K.: Immunization against typhus fever, 11
Orbital region, radiography of (Stenvers), 34

P.

PANSERA, Giuseppe: Shell shock, 14
PARISOT, Jacques: Causation of trench foot, 46
Peripheral nerves. *See* Nerves
PHILIPOWICZ: Selection of an antiseptic, 37
Pleura, localization of foreign bodies in (S. Gangi), 35
PLOTZ, H.: Immunization against typhus fever, 11
POIRÉ: Delivery through shell wound, 22
POTHERAT: Wounds of vessels, 30
Projectile divides femoral artery and vein without bleeding (Jumon), 9
Projectile lesions of brain and spinal cord (G. Mingazzini), 1
Projectile wounds, late opening of arteries in (Raymond Grégoire), 21
Projectiles in the heart (Pietro Gilberti), 52—(Silvan), 53
Projectiles, migrations of in the circulation. *See* Circulation
Projectiles, wanderings of in the veins. *See* Veins
Psoriasis, emotional (Carlo Vignolo-Lutati), 3

R.

Radiography of the orbital region (Stenvers), 34
RATYNSKI: Soap as a dressing for wounds, 18
RAYMOND, Victor: Causation of trench foot, 46
RIVALTA, R.: Simulation of skin diseases by soldiers, 36
RUSS, Charles: Electrolysis in open suppurating wounds, 54
RYAN, Major Edward: Shell shock, 13
RYCHLIK, Emmanuel: Gas abscess of the brain, 17

S.

SAINT: Delivery through shell wound, 22
SAUPIQUET, A.: Middle-ear lesions from aërial commotion, 31
SAVILL, Agnes: *X*-ray appearances of gas gangrene, 32
SBORDONE, G.: Simulated conjunctivitis, 48
SCHMIDT, H. H.: Infiltration anaesthesia, 19
Shell shock (Major Edward Ryan), 13—(Giuseppe Pansera), 14
Shell wound, delivery through (Saint, Goelinger, and Poiré), 22
Shrapnel bullet wandering in the circulation (A. Grandgérard), 20
SILVAN: Projectiles in the heart, 53
Simulated conjunctivitis (G. Sbordone), 48
Simulation of disease (Edgard Blum), 47
Simulation of skin disease by soldiers (De Napoli), 25—(Carraccio), 26—(R. Rivalta), 36
SINGER, Kurt: Symptoms of nervous heart, 24
Skin disease, simulation of by soldiers: (F. De Napoli), 25—(Mariano Carraccio), 26—(R. Rivalta), 36
Skull injuries, transplantation of bone in (Albert E. Morison), 49
Soap as a dressing for wounds (Ratynski), 18
Spinal cord and brain, projectile lesions of (G. Mingazzini), 1
STENVERS: Radiography of the orbital region, 34
Stomach, gunshot wounds of (R. Fibrich), 28
STOOKEY, Captain Byron: Gunshot wounds of peripheral nerves, 6

T.

TAYLOR, Kenneth: *Bacillus pyocaneus* infection, 8
TRAMBUSTI: *Diplococcus lanceolatus* as a cause of suppuration in compound fracture, 58
Trench foot, causation of (Victor Raymond and Jacques Parisot), 46
Typhus fever. *See* Fever

V.

Veins, wanderings of projectiles in (Achille Mogti), 44. *See also* Circulation
VIGNOLO-LUTATI, Carlo: Emotional psoriasis, 3
VILVANDRÉ: Diagnosis of gas in the tissues, 10

W.

War aphonia (G. Liébault), 2
WATSON, Colonel C. Gordon: Primary wound suture, 51
Wound suture, primary (Colonel C. Gordon Watson), 51
Wounds from aërial torpedoes (G. Kelemen), 40
Wounds, brain, meningitis after (Hart), 55
Wounds in the present war (A. U. Desjardins), 29
Wounds, gunshot, of abdomen (E. Liek), 27
Wounds, gunshot, of head (Richard Fibrich), 41
Wounds, gunshot, of peripheral nerves (Captain Byron Stookey), 6
Wounds, gunshot, of stomach (R. Fibrich), 28
Wounds, gunshot, treatment of infected (Joseph Rilus Eastman), 50
Wounds, heliotherapy of (Magrassi), 56
Wounds, open suppurating, electrolysis in (Charles Russ), 54
Wounds, projectile, late opening of arteries in (Raymond Grégoire), 21
Wounds, soap as a dressing for (Ratynski), 18
Wounds of vessels (Potherat), 30

X.

X-ray appearances of gas gangrene (Agnes Savill), 32—(Martin Berry), 33

Printed and published by the British Medical Association at their Office, No. 429, Strand, in the Parish of St. Martin-in-the-Fields, in the County of Middlesex.

AN EPITOME OF CURRENT MEDICAL LITERATURE.

War Number.

MEDICINE.

1. Projectile Lesions of Brain and Spinal Cord.

AT a meeting of the Royal Academy of Medicine of Rome held on November 26th, 1916 (*Policlinico*, January 1st, 1917), Professor G. MINGAZZINI reported the results of projectile wounds in various zones of the cerebral surface, and of injuries, direct or indirect, of the spinal cord. The psychical symptoms remaining after cranio-cerebral injuries have been carefully studied by Marie and Froment, and Mingazzini agrees with those neurologists that attaeks of giddiness and paroxysms of passion are frequent sequels. In his opinion other mental disturbances, such as dysmnesia, slowness of perception, emotional instability, and so forth, vary from case to case; in some, on the closest examination, nothing particular is discovered, whilst in others the syndrome is much more marked and more serious, sometimes amounting to a quasi-substuporous condition. Mingazzini thinks it premature at present to affirm that there are psychic signs peculiar to lesions of any cerebral zone. The depth and extent of the lesions and the circulatory difficulties produced by adhesions between the meninges and the convolutions must be taken into account. Mingazzini related four cases of lesions of the spinal cord—one of the lower cervical, two of the dorsal, and one of the lumbo-sacral region. In two of these cases radioscopic examination failed to reveal any injury of the vertebrae or any foreign body in the vertebral canal. He thinks it possible that central haematomyelias may be produced by violent concussion of the vertebral column. Commenting on two cases, one an example of ataxic-paraplegic syndrome, the other of hysterical paraplegia following commotion of the spinal marrow in which complete recovery took place, he says that hysteria must not be regarded as a predominant factor. He holds that if, for instance, in the early days of hysterical paraplegia incontinence of urine, even if transitory, is observed, it is probable that there has also been a true commotion of the sacral medulla. As the outcome of a study of three cases of lesion of the cauda equina Mingazzini insists that the prognosis is relatively favourable, even when extreme atrophy of the muscles, with intense pain of the lower limbs and pain in the rectum and bladder, would seem to point to an incurable syndrome. He advocates non-intervention, and in support of this view cites a case of atrophic paraplegia of the gravest character in which improvement began in the first weeks after the injury and went on till at last there remained nothing but total paralysis of one foot and partial paralysis of one leg. An appropriate arthrodesis made the patient able to walk fairly fast with the help of one stick. Professor Durante, who took part in the discussion, stated that in the large number of cases of tumours or other lesions of the brain which he had had occasion to study, he had always observed that the psychic phenomena manifest themselves when the cerebral nervous tissue takes part in the morbid process, with symptoms of reaction; or, in the case of growing neoplasms, where there is pressure by one lobe on the other which gradually by general intracranial compression extends to the other cerebral centres. On the other hand, when there is simple compression which is not transmitted to the other cerebral centres, localization signs are more distinct, and then only psychic symptoms, motor, sensory and sensorial, are observed, which are directly dependent on the compressed zone.

2. War Aphonia.

G. LIÉBAULT (*Rev. de laryngologie, d'otologie*, etc., October 31st, 1916) says that among the men who have lost their voice in the war, some attribute their aphonia to commotion or nervous traumatism caused by the explosion of shells. In most, however, the affection comes on gradually without shock. Some come to the services of voice re-education with a diagnosis of more or less obstinate nervous aphonia, others with one of laryngitis of suspicious or distinctly bacillary nature. Among them, in addition to evident bacillary lesions, there are some in whom examination of the larynx shows simple lesions of overstrain of the voice or chronic laryngitis. Appropriate treatment with a course of phonetic re-education effects a cure and prevents discharge from the army. Liébault saw ten cases of this kind. All traced the affection to their stay in the trenches, where they suffered from fatigue, cold, and wet. Beginning in a cold, which developed into bronchitis and laryngitis with cough and hoarseness, loss of voice supervened. Often it was several weeks before they came under treatment. As a rule the men had been several months in the trenches, and were thin and generally run down. On auscultation, râles, sometimes localized in the upper parts of the lung, are heard; there is a little dullness at one or both apices. Tuberculosis is suspected, but very often no bacilli are found, and the man is sent to be treated for laryngitis. In some the mirror shows at first sight a normal state of things; it is only when an effort is made to produce the voice that it is seen that the vocal cords do not approximate; there is paresis of the constrictors, which may be affected all together or separately. Such a case is one of pure nervous aphonia, curable by ordinary care and re-education. There are other cases, more ill-defined in character, which may give rise to the suspicion of incipient tuberculosis. Examination is difficult owing to an irritable condition of the mucous membrane; the upper orifice of the larynx is sometimes swollen and at first sight the interarytaenoid region looks thickened and velvety; the ventricular bands are also tumefied. In spite of these appearances, many elements warranting the diagnosis of bacillary laryngitis are lacking. There is no pallor of the velum, sometimes, on the contrary, there is increased redness; no hyperaesthesia, but only pharyngeal irritation. Careful analysis of the objective intralaryngeal conditions is important. The swelling of the ventricular bands is a thickening rather than an infiltration. The thickening of the interarytaenoid mucous membrane, which used wrongly to be regarded as a premonitory symptom of laryngeal tuberculosis, is in the cases under consideration a hypertrophic rather than an oedematous condition. Moreover, the mucous membrane covering the arytaenoid cartilages looks healthy, and the cartilages themselves move freely; the aryepiglottic folds do not show the puffiness characteristic of bacillary laryngitis. If the doctor tries to make the patient produce a sound the whole laryngeal vestibule is seen to close up, so that the vocal cords are hidden; if seen, they are often white, sometimes a little rough and reddened, but they never present the erosions like finger-nail scratches or the carmine redness which is so suspicious in a patient suffering from fatigue. Lastly, they work imperfectly. The interesting point in these cases is that the constitutional state and the condition of the lungs combine with the appearances in the larynx to arouse suspicion. If to these laryngeal and pulmonary symptoms are added the fatigues of trench life, and if the man after months of privation has lost flesh, he will almost inevitably be taken to be suffering from tuberculosis. But the absence of bacilli from the sputum and the condition of the larynx should put the observer on the right path. When a correct diagnosis is made, cure is, with proper treatment, a matter of a few weeks, and the man can return to duty. On the other hand, a wrong diagnosis causes long stays in one hospital after another, with pulmonary treatment which improves the bronchial condition, but also with a laryngeal therapy of fumigations, inhalations, wet compresses, and so forth, which has never alone cured laryngitis caused by wrong use of the voice. The result is likely to be discharge from the army of men who if properly treated are fit for further service. Liébault thinks such cases are not rare.

3. Emotional Psoriasis.

CARLO VIGNOLO-LUTATI, dermatologist to the Carlo Alberto dermopathic institute of the S. Luigi Hospital, Turin, says (*Policlinico*, December 3rd, 1916) that those who during the war have had the opportunity of watching the development of certain affections of the skin in soldiers have noted that some of them are relatively frequent owing to the circumstances in which the men are placed.

Among them is psoriasis. Apart from the recognized causes of that disease the war has brought to notice many cases due to nervous shock or which have followed a wound, the lesions following a wound and appearing in its neighbourhood or near the cicatrix. The author holds that in such cases the chief cause of the psoriasis is emotional disturbance; the wound is only the point of least resistance, which is the starting point of the disease. Of eighty-six soldiers, aged from 22 to 35, affected with psoriasis who came under the observation of Vignolo-Lutati within a period of eight months, fifty-two came from the war zone. Among these there were eighteen who stated that they had not previously suffered from the disease; most of them had been for some time in the trenches and in the firing line. In two it was possible to determine the almost immediate influence of emotional disturbance on the onset of the skin affection. In one, a man of 25, the first manifestations appeared three days after he had taken part in the cutting of wire entanglements; in the other the psoriasis appeared fifteen days after a scare due to the death of a comrade. On the other hand, in two other cases the onset of the disease was caused not only by emotion but by wounds. In one of them the patient was a sublieutenant of Alpini, aged 24, who was severely injured by a fragment of grenade, which made a comminuted fracture in the lower third of his left leg. He was at once taken to a surgical station, and after a stay of a month and a half in hospital small scaly lumps began to appear in the neighbourhood of the still open wound; soon similar crops came out successively on different parts of the body. The lesions were those characteristic of psoriasis distributed on the seats of election. The patient had never before suffered from the affection. The other patient was a soldier, aged 26, who was slightly wounded on the right foot by a fragment of projectile. After twenty days a typical psoriasis, starting in the neighbourhood of the wound, showed itself for the first time. The man had been much upset immediately after he was wounded by the fear of losing his foot. Vignolo-Lutati discusses the influence of the nervous system on the production of psoriasis, and concludes that it must be taken in a very wide sense. It certainly plays a part in the pathogenesis of some cases of the disease, but its influence is particularly exerted in the direction of weakening the resisting powers of the organism. Thus, among the so-called emotional forms of psoriasis analogous to those more properly called traumatic, it would be permissible to speak of nervous traumatism, or psychic traumatism inducing the explosion on the skin. Such forms of psoriasis occur only in those predisposed to the affection. An injury, a nervous shock, an emotion or fright—factors all more than usually frequent in time of war—must be looked upon as occasional exciting causes acting on a latent predisposition.

4. Cardiac Overstrain in Soldiers.

C. LIAN (*Réunion méd. chir. de la nº armée*, June 2nd, 1916; abstract in *Archives des maladies du coeur*, November, 1916), in a paper on cardiac overstrain in soldiers, says that, if lesions of heart strain properly so-called are exceptional, one often enough observes cardiac disturbances of less intensity characterized by palpitation, dyspnoea, painful oppression in the precordial region when marching with full pack, and physical work. Examination gives negative results, but a simple change from the recumbent to the standing position makes the pulse rise to 100 or 120 or even 140 after the slightest effort. Return to the initial rate takes place much more slowly than in a normal subject. These symptoms are due to overstrain, which occurs more easily in a heart affected with moderate myocarditis consecutive to an infectious disease or in men with constitutional weakness of circulation (the irritable soldier's heart of English writers). Even after some weeks of rest and treatment (strychnine) these men when sent back to their units should be exempt from hard duty.

5. The Cardiac Rhythm in the Fighting Soldier.

BINET (*Arch. des maladies du coeur*, November, 1916) says that as a consequence of prolonged fatigue and overstrain bradycardia is frequent in the soldier on active service, and is sometimes accompanied by fever. He has found 56 per cent. of men in whom the pulse was less than 70, instead of 6 to 7 per cent. in normal conditions. Emotional shocks sometimes produce no change of the heart rhythm; sometimes they are followed by acceleration, more often by slowing. After wounds acceleration is generally observed except in certain cases of injury of the skull or chest.

SURGERY.

6. Gunshot Wounds of Peripheral Nerves.

CAPTAIN BYRON STOOKEY, R.A.M.C., temporary assistant to Lieutenant-Colonel Robert Jones, Inspector of Orthopaedics, Army Medical Service, has published (*Surg., Gynaec. and Obst.*, December, 1916) a paper based on a study of seventy-five cases of nerve injury. The number of such injuries in the upper limb greatly exceeded that in the lower. Of those in the upper limb the musculo-spiral nerve was involved in 36 per cent., the median in 17 per cent., and the ulnar in 41 per cent. The frequency of the injury is probably due to the intimate relation of the nerve to the humerus. Fracture, complete or incomplete, of that bone occurred in 50 per cent. of the musculo-spiral injuries. In those of the lower limb the internal popliteal nerve was not once injured, while the external popliteal was wounded in four cases. The sciatic nerve was incompletely severed in eight cases, never in any case completely; in each of the eight cases the portion forming the external popliteal was the part involved. The author says the ideal operative procedure would be primary suture, but this is hardly ever practicable in war surgery, as nearly all wounds are infected, and this necessarily delays operative intervention and makes it more difficult because of excessive scar formation. Peripheral nerves may be injured by direct violence of the bullet or shell, or indirectly by the velocity of the missile and the transmission of its vibration, causing either concussion or contusion, usually both. This may produce a more or less transient block of nerve conductivity. In some instances there appears to have been a haemorrhage in the nerve trunk. The blood may be absorbed, leaving little subsequent impairment, or it may undergo organization with formation of dense scar tissue in the nerve trunk. In injury by direct violence the nerve may be severed completely or partially; this seems to depend on its size. Stookey has never seen the sciatic completely divided. Nerve lesions, when seen at a later period, show the nerve involved in a mass of scar tissue which is often extremely dense. When the nerve is completely severed the proximal end is usually bulbous, hard, and slightly irregular; the distal end is small, frayed, and diffused in surrounding scar. Secondary implication of the nerves arises in wounds of soft parts or involving bony structure either by overgrowth of scar tissue or callus, or both. In these injuries there may be either complete or incomplete anatomical or physiological division. It is not possible to distinguish before operation between a complete anatomical or physiological lesion. Both destroy the conductivity of the nerve; hence both manifest themselves functionally in the same manner. It is possible, however, in most instances to distinguish between complete and incomplete lesions. In the latter case the patients usually complain of neuralgic pains. The extremities show a glossy, shiny, mottled red skin, tender in parts to nearly all stimuli. The skin is usually drawn tight over the fingers, and the subcutaneous tissue appears to be small in amount. There is generally sweating which is markedly acid and strong smelling. Sweating is not usually excessive unless there is an irritative incomplete lesion. In cases of complete division, either anatomical or physiological, operations should be performed as soon as the primary wounds have healed. The surgeon should, however, bear in mind the possibility of recrudescence of infection in cases without obvious lesions, particularly in wounds complicated by fracture. In these it is occasionally found that a small fragment of bone lies loose in scar tissue, surrounded by a drop of mucopurulent fluid. Such a complication cannot be foreseen. It is better to delay longer in cases in which there has been a fracture, particularly if there has been much comminution and small pieces of metal remain. In view of the pathological findings in the majority of these cases, it does not seem to the author justifiable to delay operation three, six, or eight months to see if the nerve will unite unassisted. Exploratory operations seem to him justifiable in all cases in which there is no contraindication. Delay in operating in most instances means delay in recovery. When the nerve is freed and the scar tissue removed, a gap of several centimetres or more may be left. Several expedients are available. First, there is tubulization, hardened arteries or Cargill membrane being used, and the ends being threaded together; in no case, however, has Stookey seen any improvement produced by this method. Another expedient is transplantation, using the radial or saphenous nerve; the object is to use whatever power of regeneration the neurilemma of the

transplanted nerve may possess. If this be impossible, nerve transference may be done; this in suitable cases and positions in relation to adjacent nerves seems to the author the operation of choice. In certain cases, if at the point selected in the nerve to be used the fibres are mainly sensory, the proximal as well as the distal ends of the severed nerve should be joined to the nerve trunk to which transference is to be made. The nerve trunk thus acts as a scaffolding along which new motor fibres may grow to join the distal end of the severed nerve without re-education of other and new nerve centres. Two methods, says Stookey, should be condemned: nerve stretching, and suturing with the limb markedly flexed. When the nerve is sutured with the limb flexed there is usually some tension. Later, when the limb is slowly straightened, the scar of union of the two ends slowly becomes stretched, so that in place of a linear scar a fusiform elongated cicatrix occurs; this in turn becomes hardened with an increase of scar tissue and the aim of operation is defeated. The temptation to excise all hardened tissues about the nerve may prolong convalescence. It is known that nerve fibres will grow through considerable tissue resistance. If instead of free excision the nerve is freed and wrapped in a flap of fat or other suitable tissue, recovery is more rapid and complete. Before and after operation the greatest importance should be attached to efficient and adequate treatment to prevent contractures and overstretching of the muscle groups whose nerve supply has been cut off. The application of metal sheeting splints in cases of wrist-drop and outside irons in foot-drop is very useful. Valuable adjuvants are constant and regular massage, hot and cold contrast baths, and the galvanic current. These must be systematically applied and modified according to the stage of improvement. Accurate determination of sensory changes and careful subsequent re-examination of the sensory findings furnish more valuable information, both as to the extent of the injury and the rate of recovery, than the muscular reactions. Careful charts should be kept and attention paid to the contraction of the borders of sensory loss. Shrinkage of these, more especially of the border of loss to the sense of pin-prick, is of the greatest value. Careful clinical observation of sutured nerves has not lent support to the theory of primary union of divided nerves. The author has in all his cases tested carefully with cotton-wool and pin-prick, and in no instance has there been immediate return of any form of sensation. Return of function varies with the site of the lesion, the nerve involved, and the nature of the wound, as well as the distance of the lesion from the periphery. The nearer the lesion to the periphery the earlier is the return of motor function. This does not hold true for sensory disturbances; the muscles supplied nearer to the lesion regain their function soonest. Stookey gives full clinical details of various lesions, and the paper is well illustrated.

7. Bone Surgery.

AT a meeting of the Medical Society of the County of New York held on October 23rd, FRED. H. ALBEE (*Medical Record*, November 25th, 1916) related some experiences in France. At the present time the chief feature of the war was the surgery of the bones, tendons, and nerves. It took an immense amount of time for septic war wounds to clear up under the older methods of surgery. This was not the case with the Carrel-Dakin method of sterilizing wounds. In many of the war wounds there was a great amount of lost tissue, and when such wounds were treated by the Carrel-Dakin method the results were most remarkable. The granulations were a deep, healthy red in colour, the edges of the wounds were not inflamed, and the skin was not indurated or sensitive, and would slide about the wound very readily. These wounds were different in appearance from any he had ever seen. When a case came from the front the first step was to look for foreign bodies and localize them. For this the fluoroscope was used and the foreign body charted. The surgeon then removed the foreign body, and all the lacerated tissue was carefully trimmed away. Next a fenestrated rubber tube, covered or not with gauze, was fastened in the wound, and sutured or not. The tubes were laid so that the gauze might be kept saturated with the solution all the time. The reservoir was so arranged that by turning a stopcock the solution could be fed into the tubes. Just enough was allowed to flow in to keep the gauze saturated to the proper degree. A thick coat of yellow vaseline was applied around the wound. In some wounds a system of tubes was used. If the wound was a stump it was soaked in the solution. Bacteriological examinations of the wounds were made every second day, a smear being taken from the worst part of the wound. When only one or two bacteria were found in the microscopical fields the wound was closed. The microscopical appearance alone was not to be trusted as an indication of the time the wound might be closed. By this method of treatment the percentage of primary unions had been over 95. It was applicable to compound and comminuted fractures as well as to flesh wounds. Albee demonstrated with the aid of motion pictures his method of putting in bone grafts, which was very effective in restoring limbs from which large portions of bone had been lost. These bone grafts were much used in jaw surgery. H. H. M. Lyle showed coloured photographs of wounds treated by the Carrel-Dakin method. The point he wished to make particularly clear was that this treatment was not merely the employment of a certain antiseptic, but a plan consisting of an immense amount of detail. There was no pus in these wounds and no inflamed edges. By the older methods it took about three months, sometimes much longer, for a compound fracture to heal; by this method most of these wounds healed in from twenty-eight days to six weeks. In 450 cases treated by this method and sutured up, there were only six failures, and these were not bullet wounds, but the more severe war injuries. Depage had reported 137 cases with two failures; eighty compound fractures without a drop of pus.

8. Bacillus pyocyaneus Infection.

KENNETH TAYLOR (*Journ. Amer. Med. Assoc.*, November 25th, 1916), working in the Robert Walton Goelet Laboratories, has found that *Bacillus pyocyaneus* is a frequent cause of delay in the healing of wounds. Examination of the discharges in a large number of cases showed that when the reaction of the pus was strongly acid the *B. pyocyaneus* was seldom present. It is much more common in wounds with secretions of low acidity, especially in those giving a faintly alkaline reaction. Attention was therefore directed to the acid antiseptics in applying dressings to such wounds. A group of organic and inorganic acids was first tested. Nitric and hydrochloric acids in dilute solutions were found to have a very slight inhibitory effect on the organisms involved. Butyric, propionic, malic, tartaric, and acetic acids were found to be much more effective, and the inhibition seems to be a specific property of some of these organic acids. Since acetic acid was more effective than the others, and always available, it was further investigated. A series of 111 patients was taken on admission and unselected unless some special indication was present, and a dressing of the same solution was applied continuously. A table of the effects of the different solutions shows that pure acetic acid was most effective (cresol coming next) in inhibiting the growth of *B. pyocyaneus*, and was consistently active in ridding infected wounds of this organism. In no case was it found after one week's use of the acetic acid dressing. No other dressing solution had this speedy effect. Cresol, while active *in vitro*, was clinically ineffective. Since these experiments were made a 1 per cent. solution of acetic acid has been used as a routine procedure for the purpose in question, and the clinical have agreed with the experimental results.

9. Division of Femoral Artery and Vein by a Projectile without Bleeding.

JUMON (*Réunion méd. de la Ire armée*, April, 1916; abstract in *Archives des maladies du coeur*, November, 1916) reports the case of a soldier whose femoral vein and artery were completely divided at the apex of Scarpa's space by a fragment of shell, and in whom for a week there was no bleeding although no compressive bandage was applied nor any ligature put on. The retracted ends of the vessels were five centimetres apart, and bleeding was prevented by clots, notwithstanding an intense suppuration of the focus kept up by the fragment of shell within the muscle and accompanied by septicaemic phenomena and extensive phlebitis of the femoral vein. The artery and vein were ligatured and the foreign body extracted. Improvement was rapid, and the wound followed a normal course.

10. Diagnosis of Gas in the Tissues.

VILVANDRÉ (*Arch. Radiol. and Electr.*, October, 1916) states that in wounds of the limbs which are sent to be *x*-rayed the technique necessary for the investigation of gas might well be applied systematically; not only should the structure of bones and foreign bodies be shown, but an endeavour be made to radiograph the soft tissues as a routine. In this way the radiographer would be able to point out to the surgeon the presence or absence of gas in the tissues in all cases submitted, whether gangrene be suspected or not. In one case of a gunshot wound in the thigh, the diagnosis of the complicating condition was made entirely

by *x* rays; the first sign of the trouble was the negative shadow above the patella, and a second plate showed the upper limit of the gas. The clinical diagnosis was much less certain, and the presence of gas might easily have passed unsuspected in the first rush. The author has thought of diagnosing gas gangrene by means of the chemical reaction of the gas with some reagent. On his suggestion a hypodermic syringe filled to some extent with the reagent and used after the manner of needling for pus proved successful, the bubbles of gas coming readily without admixture with blood (in a pure state), and although no reaction took place with the acid employed in this instance, the simple technique was so satisfactory as to furnish the means of further investigation. The presence of gas in the tissues is not always due to the same organism, and although the organism concerned may be discovered by bacteriological investigation, the growth presents difficulty and takes time. Some cases end fatally, while in others, where the tissues are equally penetrated with gas, recovery takes place through multiple incisions. It would be useful to know, he thinks, whether the gas in the different cases is of similar composition and furnishes a similar reaction. A reaction which could be quickly performed by any surgeon, and upon which a differential diagnosis might be based, would be a great advantage.

THERAPEUTICS.

11. Immunization against Typhus Fever.

H. PLOTZ, P. K. OLITSKY, and G. BAEHR report (*Journ. Amer. Med. Assoc.*, November 25th, 1916) their observations of prophylactic immunization against typhus fever in the Balkans in the summer of 1915. The vaccine consisted of a suspension of fifteen strains of the bacillus in physiological sodium chloride solution, sterilized by heat. After its sterility had been determined, it was then diluted so that each cubic centimetre contained about two billion bacteria, and then 0.5 per cent. of phenol (carbolic acid) or tricresol was added. Owing to lack of sufficient vaccine, the vaccinations had to be restricted as far as possible to those most exposed to the danger of infection—the orderlies, attendants, and members of the hospital staffs, and those who had to handle patients still infested with lice, or who had to do with the sanitation of villages, towns, etc. In sixty-three Bulgarian military hospitals and military sanitation units, 5,251 in all were vaccinated. According to the authors' statistics there were about 3,000 cases in the Bulgarian military hospitals; how many thousands occurred among civilians in the villages was unknown. The epidemic was not as severe as that which raged in Serbia in the spring of 1914; the mortality averaged 11 per cent. Among the 5,251 vaccinated men, many of whom were frequently exposed to infection, there occurred three cases of typhus fever. According to the Bulgarian army statistics, the number of cases occurring among the non-vaccinated was many times greater, but the figures are not available for publication. Particulars were given as regards the cases occurring in the hospitals before the institution of the vaccination and while the inoculations were being carried on. The civil population was most severely affected. Although the work was done at the request of the Austrian War Office, for military reasons the figures are guarded, and no statistics as to the total number of typhus cases during the winter and spring of 1915–16 have ever been published. The typhus epidemic, however, was widely spread in Volhynia, and the vaccine was used on 3,169 persons in forty-six institutions. "In all," say the authors, "8,420 persons, members of 109 hospital, sanitation, and other units in Serbia, Bulgaria, and Volhynia, were vaccinated against typhus fever during the epidemic of 1915–16, an attempt being made to include in this number only the persons who were most exposed to the dangers of infection. Of this number, six developed the disease during the four months of the epidemic. Our experiences in the Balkans and Volhynia during the winter and spring of 1915–16 with the vaccine made of *B. typhi exanthematici* would seem, therefore, to indicate that it is capable of reducing the incidence of the disease, although it does not produce an absolute immunity to typhus fever."

PATHOLOGY.

12. Effects of Asphyxiating Gases on the Air Passages.

G. BILANCIONI (*Archivi italiani di Laringologia*, October, 1916; *Policlinico*, December 17th, 1916) reports experiments made in the Institute of Physiological Chemistry of the University of Rome to ascertain the effects of "phosgene" (carbonyl chloride, a colourless gas with a suffocative odour, formed by the action of carbonic oxide and chlorine) and bromine on the air passages of rabbits and rats. The elementary lesions caused by asphyxiating gases are few but of extreme gravity. First, there are lesions of contact, that is to say, those caused by breach of the mucous membrane of the larynx, trachea, the large bronchi, sometimes of the pulmonary alveoli and the oesophagus. The membrane is in a state of necrobiosis or is badly lacerated, and detached in large strips from the underlying layer (necrosing inflammation). This is especially the case in the larynx, but sometimes occurs in the large bronchi, particularly through the action of phosgene. Besides this, oedema is seen in the submucosa of the oesophagus and in the lung, where the albuminous liquid characteristic of pulmonary oedema manifests itself as an amorphous, glittering deposit in the bronchi or in the larger alveoli. The most common and most impressive lesion, however, is very intense hyperaemia, which by rupture of the vessel walls leads to the effusion of blood into the laryngeal submucosa or into the pulmonary parenchyma and thence into the bronchi. The amount of blood thus effused is enormous; a simultaneous rupture of many vessels has to be assumed to explain how the lung becomes, as it were, stuffed with blood in its smallest recesses. This phenomenon is most manifest in poisoning with phosgene; its action also causes thromboses in vessels of a certain size. A most important lesion is the fragmentation seen in some intrinsic muscles of the larynx in rats killed by phosgene. In regard to this phenomenon, certain facts are already known mostly relating to the heart in diphtheritic patients. Under the name of "myocardite segmentaire essentielle chronique" Renaut described a pathological condition of the cardiac muscle producing progressive weakness and paralysis of the heart. The anatomical changes consist, according to him, in a dissolution of the connective tissue of the muscle cells, which makes the fibres appear divided in segments. According to Bilancioni, however, later researches have shown that instead of the alleged dissolution of the connective tissue there are multiple ruptures of the muscle fibres. These occur irregularly; hence the fragments are unequal in length and some have lost their nuclei. The ends of the fragments are irregular and present fringes, the splitting extending along the fibres. This conception is, says Bilancioni, more in harmony with what is known as to the normal histology of the myocardium. This does not consist of fibro-cells bound together by connective tissue, but is a retiform muscle with its elements fused together in a syncytial mass. The fragmentation occurs sometimes in healthy fibres, sometimes in those altered by fatty degeneration. Rupture is seen in various conditions: acute infections such as typhoid, influenza, acute polyarthritis, miliary tuberculosis, septicaemia; chronic diseases such as anaemia, hepatic cirrhosis, nephritis, the cachexia of malignant disease, and poisoning by chloroform, carbonic oxide, carbolic acid. The form called by Eppinger "toxic myolysis" is most frequent, and occurs most readily when death takes place rapidly. The opinion most generally held now is that this change occurs *in articulo mortis*, and depends on spasmodic contractions of the muscular fibres. On the true significance of this lesion when induced by asphyxiating gases the author can only frame hypotheses, but he thinks the fact that the fragmentation involves, among the intrinsic muscles of the larynx, especially the dilators and constrictors of the glottis, worthy of consideration. It is probable that it is aided by the convulsive opening and closing of the larynx when the animal is exposed to the wave of toxic gas. Examination of lesions caused by these gases in the respiratory passages and digestive *primae vivae* shows that these correspond perfectly with those observed, especially by British and French doctors, in soldiers who have been "gassed." The laryngeal lesions, especially those of haemorrhagic character and the oedematous imbibition of the lungs, are the most conspicuous features in the clinical picture and cause the most agonizing symptoms. In contrast with these is the state of things in the upper respiratory passages, in particular the nasopharynx, where lesions are very few or altogether wanting. This may be partly due to the defensive apparatus in that region, partly to the shortness of the time the gas is in contact with those parts. On the other hand, the vapours once introduced into the lung, where their action is reinforced by the excursive movements of the thoracic cage, have every opportunity of coming in contact with all the windings of the respiratory apparatus.

AN EPITOME OF CURRENT MEDICAL LITERATURE

War Number.

MEDICINE.

13. Shell Shock.

MAJOR EDWARD RYAN, C.A.M.C., head of the Neurological Department, Ontario Hospital, Orpington, records the case of a soldier who, on June 1st, 1916, was blown up in his dug-out (in France) by a shell which killed all his comrades (*Canadian Pract. and Rev.*, December, 1916). He was rendered unconscious, and on recovering his senses his ears were ringing and his voice very faint. Another shell blew him up and he again lost consciousness. When he came to he was in a dressing station. He had violent headache, and was completely deaf and dumb. On admission to the Ontario Hospital he was still suffering from headache, and he complained of pain and tenderness along the course of the seventh nerve, well up in the temporal region, across the forehead, and along the course of the posterior auricular nerve. He was absolutely deaf, and could not speak, whistle, or laugh. There were no marks of external violence and no organic lesions. In respect of psychic manifestations the patient was clear as to time, place, and person; his memory for past events was undisturbed; for recent events it was quite clear up to the time of the shock. There the train of events was broken. He was depressed, and his countenance had a strained and anxious look; he seemed to be struggling hard to adjust the train of events. He would rest on his elbow with his hands in constant motion. His lips frequently moved as if he were talking to himself. There were fallacious sense perceptions, especially of hearing; he maintained that he heard the noise of the bursting of shells, the explosion of mines, the crack of rifles, and the general din of battle. He constantly declared that his hearing was normal, but that those conversing with him would not speak aloud. He was irritable and peevish, especially when doctors, nurses, or visitors were present. The only delusion noted was that a friend who was in another ward had visited him and remained all night. There was nothing very abnormal in his conduct. He expressed in writing a hope that the barber who shaved him would make a clean job, making his meaning plain by drawing his finger across his throat. Precautions were taken against suicide. Early in the morning of June 14th he began to speak, at first in a thin, indistinct voice, which afterwards gained volume daily. When convinced he could speak, he improved rapidly and gained weight. At the date of report he was still stone deaf, but this did not trouble him much as he felt that having regained speech he would in time recover hearing. Ryan thinks with most other observers that the condition is purely psychic, but that trauma and the idea of a trauma are contributory or predisposing causes. In many of the cases which he has seen in the various hospitals the earmarks of degeneracy were observable. As an example of the types most frequently affected Ryan cites the case of a sapper with the following family history: The father, aged 74, was very nervous, was said to have Bright's disease, and as far as the son could remember had never done any work. The mother died aged 58; she had been ailing for eighteen months, was very nervous and suffered from diabetes. Of four brothers one died young, another who had been epileptic for years died in the street as the result of a fit; a third was killed by a fall; the fourth was alive and well. Of two sisters one had fits, while the other was very delicate. The patient himself when young had frequent fainting attacks during which he partly lost consciousness. He had had similar attacks several times since he joined the army. As for treatment Ryan says it is essential that these cases should be taken early. Each case must be dealt with according to individual indications. The idea of injury must be removed, and what Mott calls an "atmosphere of cure" must be created around the patient. Hot packs and baths, continuous baths, alcohol rubbings and massage were used with very satisfactory results. Rest in bed with forced feeding is always essential. Ryan has not found anaesthesia of any service.

14.—At a meeting of Italian Medico-Chirurgical Field Societies held in the war zone on October 20th (*Policlinico*, December 10th, 1916) GIUSEPPE PANSERA presented a case of loss of speech caused by nervous shock. The patient was a soldier who in August, 1916, became mute after the explosion of a grenade close to him. He was kept for forty days in a military hospital, where various therapeutic measures were tried without success. He was discharged while still dumb with ninety days' convalescence leave. He was arrested as a deserter—perhaps because, when still suffering from the effect of the shock, he had left his regiment—and was condemned to imprisonment. He was sent to another hospital, and on admission he was completely speechless, but his hearing was normal. He was placed under ether anaesthesia and recovered speech; at first it was monosyllabic, but after a course of vocal exercises it became normal. In answering questions he stammered a little—a defect which he had not had before his injury. That he was not a malingerer was shown by a certificate from the principal officer of the hospital where he had first been under observation, that the condition was caused by an injury received in the service. Another proof of the genuineness of the case was the manifest emotion and joy of the man when the action of the ether ceased and he found that he could utter a few words. At the same meeting Chiadini, Director of the Section of Nervous and Mental Diseases in another field hospital, said the interest of Pansera's case lay in the success of the treatment, which was all the more remarkable since the case had proved refractory to the suggestive and emotive methods previously tried. But he could not believe that, through the elective action of chloroform and ether on the lipoid substances of the brain, that organ suddenly passed from a state of inhibition to a normal extrinsication of thought with correct expression in words. There remained the hypothesis of a suggestive action associated with all the means which therapeutic invention could devise and adapt to individual cases. He had collected the histories of sixty-eight soldiers affected with motor inhibition of speech, in all of whom he had to exclude cortical and subcortical motor and sensory forms of aphasia and insular aphasia. The syndromic variations presented by his patients were not very marked. In all his cases he believed that the centres of motor and sensory speech and their relation one with the other and with the periphery were intact; but one of the two centres was separated from the ideative centre, and therefore from the whole of the remaining cortex; there was therefore an interruption of the association fibres going from the whole cortex to each of the speech centres. All this must be taken in the functional, not the anatomical, sense. The majority of the soldiers, as a consequence of recent psychic injury (mostly shock from the near explosion of large projectiles), present motor inhibition of spontaneous speech, while retaining the faculty of repeating words pronounced to them syllable by syllable. At the same time they preserve their understanding of the spoken word and the power of writing to dictation and reading aloud. Spontaneous writing is abolished. The word corresponding to thought does not come, or, if found, is not uttered. These symptoms form a first category, called by the author "transcortical motor aphasia." This picture is not always so sharply defined; sometimes while the power of reading is abolished that of writing is retained. In a second category, "transcortical sensory aphasia," the author places cases in which words can be repeated but without understanding of their meaning; thought cannot find the word, but the power of writing to dictation and reading aloud are preserved. In those patients the power of spontaneous writing or writing to dictation is for the most part preserved, while that of reading is abolished. A few cases may be placed in a third category, "amnesic aphasia." The patient can speak easily, and distinctly observes the form of things; he has difficulty, however, in finding indications of objects and names of persons and concrete substances, or cannot find them at all. That is to say, he is incapable of

internally co-ordinating the sound of words with the words themselves. The understanding of spoken and written words is not altered. In all his patients Chiadini found evident marks of hysteria, but this may be merely concomitant. In certain patients some degree of cerebral commotion must be admitted to explain the condition, which is not curable except after long and patient reconstituent treatment. In the discussion Sironi related the case of a little girl who had become dumb as the result of a fright, to whom speech was at once restored by suggestion applied after suitable religious stage preparation by a high ecclesiastical dignitary. Santoro maintained that cases of hysterical mutism are cured by any kind of treatment, and he referred to a case of aphasia in a soldier which disappeared immediately as the result of a strong impression produced by the threat of a serious operation.

SURGERY.

15. Operation for Neuralgia of the Third Cervical Nerve from Gunshot Injury.

V. HOFMEISTER records (*Bruns's Kriegschir.*, Heft xxvi, p. 211; *Beitr. z. klin. Chir.*) an interesting case of neuralgia following injury of the third cervical nerve. A shrapnel bullet entered the middle of the posterior aspect of the neck on September 2nd, 1914, carrying with it a portion of a stud, shattering the transverse processes of the third and fourth cervical vertebrae, and becoming lodged beneath the left angle of the jaw. Subsequently, increasing pain was felt in the area of distribution of the great auricular nerve, which later took the form of unbearable neuralgic attacks. On September 8th the projectile was removed, and the wound healed well. The neuralgia, however, called for the regular administration of morphine; the diagnosis of its precise cause was not easy. The possibility of the general psychic condition being a factor was not overlooked, but careful observation left no doubt that a well defined neuralgia of the great auricular nerve was present, and that its cause was to be looked for in a local organic lesion. Certain anatomical indications were furnished by the *x* rays. In the first place a metallic foreign body was disclosed situated near the third vertebra, about 1 to 1½ cm. behind the transverse process. From its position it could not be made answerable for the symptoms. The rays directed from before back, however, afforded a valuable diagnostic indication in the form of a fusiform callus on the left of the column, which, reaching from the second to the fourth vertebra, was of greatest extent opposite the third. It appeared probable that the third cervical nerve was embedded in the callus. On three occasions large novocain-adrenalin injections were made at different depths, but though they must certainly have reached the trunk of the nerve they were without effect on the neuralgia; it was thus obvious that the source of the irritation was so far central that the deepest injection would fail to reach it. It was concluded, therefore, that it would be necessary to reach the nerve trunk and free it from callus and remove the latter. An operation was performed on November 27th, not without considerable difficulty due to the tough cicatricial tissue. The limits of the operation were reached in the removal of the callus, within which the nerve trunk was lost. As the foreign body was readily accessible this was removed at the same time. The complete breaking up of the nerve in the callus was of evil omen and suggested that the neuralgia originated from the central nerve stump. To follow up the nerve, however, in the partly fibrous, partly osseous tissue in the immediate neighbourhood of the vertebral artery appeared to be too hazardous; and, as an additional contraindication to opening the spinal canal, there was the danger of placing the latter in free communication with the cavity from which the foreign body had been extracted, and which might possibly be the seat of a latent infection. The wound healed perfectly, but the effect on the neuralgia was absolutely negative. On January 27th, 1915, a further operation was undertaken to get to the central side of the point of irritation and to remove the ganglion or resect the sensory root. It was decided to perform root resection by means of a laminectomy and without opening the dural sheath. A preliminary examination in the dead body showed that the excision of the third sensory root with extirpation of the ganglion would be possible after removal of one half only of the arch of the second vertebra with retention of the spinous process. Access would be still further facilitated by removal of the bone so as to include also the adjacent part of the joint surface. This plan was carried out; the posterior root was divided at its point of exit and removed together with the indurated ganglion. Healing was uninterrupted. The careful novocain-adrenalin infiltration into the muscles of the neck was of great advantage in this case, since the whole operation down to the canal was carried out without any disturbing haemorrhage. Only within the canal did some venous haemorrhage arise which might with care have been avoided and was soon arrested. The haemostatic effect of deep infiltration is of such inestimable advantage in laminectomy that Hofmeister uses it also elsewhere, as in the present case, the operation is conducted under general anaesthesia. If carefully carried out the anaesthetic effect is, however, so good that, as a rule, laminectomy can be completed without a general anaesthetic, which is only required when the nerve roots or spinal cord itself is involved in the operation. The patient was completely relieved of the neuralgia and took up his command again in June, 1915.

16. Cranial Surgery at Dressing Stations.

AT a meeting of the Réunion médico-chirurgicale de la Ve armée on October 28th, 1916, LEROY (*Presse méd.*, January 8th, 1917) presented a communication on cranial surgery at dressing stations. He said that several guiding principles must always be present in the mind of the surgeon: (1) The necessity of operating in every case, even if the anatomical lesion and the functional disturbances seem to doom the patient to certain death. Of twenty-five men brought in whose condition was considered desperate, six were saved by trephining. (2) Necessity of an immediate intervention as complete as possible. The brain wound should be sterilized by excision of the contused portion of scalp, the trephining being carried beyond the lesions to the unhurt tissues, and the wound cleansed of brain matter, infected blood clots, and foreign bodies. The *x* rays should be used whenever possible. Digital exploration of the focus is necessary, however, for the discovery of bone splinters. With experience one learns the difference between injured nerve tissue, diffluent and offering no resistance to the finger, and healthy nerve tissue which gives a sensation of soft uniform opposition. With a Kocher forceps slipped along the index finger as a guide a foreign body at a depth of 3 to 4 centimetres can be extracted. (3) The necessity of active surgery in case of post-operative infectious developments. Meningo-encephalitis, detected in the first hours by rise of temperature and the cytological examination of the cerebro-spinal fluid, must be treated by drainage of the meningeal cavity (one case cured). Hernia of the brain must be dealt with by the usual methods. In cases in which it consists of a number of small abscesses, forming a purulent sponge, resection may be performed. This method, which must be regarded as exceptional, brought about a cure in a case of trephining in which there was a cerebral hernia as large as an egg; the cure had lasted nineteen months. Leroy's own results were as follows: 48 per cent. of cures; mortality, 52 per cent. In 93 per cent. of the fatal cases death occurred within the first three days, and was due to the extent of the anatomical injuries.

17. Gas Abscess of the Brain.

EMMANUEL RYCHLIK (*Muench. med. Woch.*, November 28th, 1916) states that 121 cases of skull wounds were operated upon within twelve months in an Alpine hospital; most of them were due to artillery; 45 of the cases were septic, and of these 25 developed abscesses; in one of the cases operated on the signs pointed to a specific gas infection by Fraenkel's gas bacillus, giving rise to a gas abscess. A soldier, aged 18, wounded by splinters of stone following a grenade explosion, did not lose consciousness, but suffered many septic wounds over the body; in the head, over the right temple, was a small superficial wound; no bone could be felt on probing, and percussion of the skull caused no pain. Next day the temperature was 102.2° F.; the wounds on the body were explored and fragments of stone removed and much pus evacuated, but no gas. Next day the temperature was 103.5°. On the fifth day he complained of headache, the temperature was 102.6°, and the pulse 84; there were no general or local symptoms and no pain on percussion of the skull. On the sixth day there was paresis of the left facial nerve and of the left arm and leg. A diagnosis of abscess of the right frontal lobe was made. The wound was incised under a local anaesthetic and the right temporal lobe exposed. The dura was tense, but not pulsating; it was pierced by small fragment of bone. Stinking, haemorrhagic and foam-like pus flowed from the wound. The whole right temporal region was occupied by the abscess, into which the whole finger, and the forceps could be put; a smaller cavity was found beside this large one. The abscess cavity was syringed with hydrogen

peroxide, and a thin drainage tube inserted; the cavity was sponged out with gauze dipped in Chlumsky's solution: Acidi carbolici 30, camphorae trit. 60, alcohol. absol. 10 parts. The temperature was normal next day, and remained so. The man could sit without assistance, speak, write, and count quite correctly. The first change of dressing was made ten days after operation; a great deal of pus, with necrosed brain tissue, was discharged. No symptoms of any kind, either mental or physical, were afterwards exhibited, despite the great defect in the frontal and temporal lobes. Optic neuritis was present on each side, but more severe on the right. Fraenkel's gas bacillus has been observed to attack only the extremities, and, internally, only the uterus. Tietz and Korbsch, in a case of skull wound, found air bubbles in the pia mater, and concluded that the bacillus affected the pia mater; but their conclusion was based solely on the presence of air vesicles in the venous channels underneath the pia, and by the sickeningly sweet smell. Fraenkel himself said that the smell did not indicate the presence of his bacillus, that the vesicles might be admitted underneath the pia by the sucking in of air at the opening of the skull after death, and many of the phenomena might be explained by *post-mortem* putrefaction. Rychlik points out that in his case all the conditions necessary for gas inflammation were fulfilled—the complete exclusion of air, so that the organism grew under strictly anaërobic conditions. Signs of toxaemia were absent, and the high temperature alone indicated septic mischief. The sudden development of such a large abscess could only be explained by the structure of the brain tissue and the gas-producing properties of the organism.

18. Soap as a Dressing for Wounds.

AT a recent meeting of the Paris Société de Chirurgie (*Journ. de méd. et de chir. prat.*, December 10th, 1916) a communication was presented on behalf of Médecin-aide major RATYNSKI on the use of white Marseilles soap [practically the same as white Castile soap] as a dressing for large anfractuous wounds caused by shells. His attention was first called to its advantages by observation of its effects in extensive burns. No dressing, he says, so quickly soothes pain and brings about sound and speedy healing. The surgeon, after disinfecting his hands, dissolves in tepid water, distilled or simply boiled, a few pieces of the soap. For lavages and irrigations a solution of 1 in 40 should be used; for the impregnation of compresses one of 20 per cent. The blood-stained surfaces should first be washed with pledgets of sterilized gauze steeped in this solution; they are applied without roughness to irregularities of surface and granulations. The wound, having been well cleansed in its whole extent and all its anfractuosities, is freely irrigated with soapy water; then a sort of embalming with soap is carried out. For this purpose several compresses of sixteen to twenty layers of gauze, each impregnated with the same solution, are rubbed vigorously against a piece of soap till they are saturated. The compresses are then rolled and pressed between the palms of the hands till an abundant light froth is produced in the interstices of the gauze; in this way a spongy tissue is obtained, consisting of innumerable tiny soap bubbles, which give the dressing a porosity similar to that of a sponge. This is spread over the surface of the wound and lightly pressed, but the dressing should never be less than 1 cm. in thickness. A thickish layer of cotton-wool, with a tarlatan bandage, complete the dressing, which should be renewed every two or three days. From its first application the author always observed a notable diminution or even immediate cessation of pain. At the subsequent dressings it is seen that the soapy muslin does not stick to the wound or the surrounding parts; it comes away without the slightest oozing of blood. Owing to the porosity of the dressing it seems to pump up the secretions as they are formed on the surface of the wound; it is thus an excellent capillary drain. Ratynski has observed that the dressing is impregnated with pus, even in its most superficial layers, while there is scarcely any on the surface or dead spaces of the wound. The soap solutions appear to act by inducing the formation of a viscous ropy liquid which is all the more abundant as the wound secretes a large amount of pus. The soapy irrigations must therefore be continued as long as the viscous liquid, which seems to be due to the contact of the pus with the soap solution, persists. Under the use of the dressing wounds heal with remarkable rapidity; the red oedematous surfaces soon take on a healthy aspect. The granulations and the border of cicatrization acquire a great vitality from the beginning of the treatment. Ratynski and Bergalonne under whom he worked followed to the end of the treatment a number of extensive wounds involving all the soft parts down to the periosteum, amputation stumps, injuries of the hand by grenade explosions (which are so peculiarly painful), and constantly observed the same simple, rapid, painless course with favourable cicatrization, without retraction or induration.

19. Infiltration Anaesthesia.

H. H. SCHMIDT, writing from a German field hospital, recommends (*Muench. med. Woch.*, November 21st, 1916) infiltration anaesthesia in certain cases where it is necessary to operate shortly after the receipt of the wound. He advises paravertebral anaesthesia by injection into the nerves as they issue from the spinal cord for operations on the trunk or on the throat, and parasacral anaesthesia in operations on the pelvis and on the lower extremities; nerve anaesthesia is useful for peripheral parts of the limbs, and also in the form of plexus anaesthesia—that is, the injection into the plexuses of nerves supplying the upper or lower extremities. Nerves coming off the spinal cord are to be met with, approximately, in one line which runs from a point 2 cm. from the middle of the neck to a point 3 cm. from the spinous process of the fifth lumbar vertebra. The depth at which the nerve is reached by the point of the needle varies from above downward. The nerve is generally situated from 1 to 1½ cm. in front of the bone when it is touched with the needle. If the anaesthetic is merely brought into the neighbourhood of the nerve, it diffuses into the nerve in ten or fifteen minutes; 5 c.cm. of a 1 per cent. solution of novocain-suprarenin, freshly made in physiological salt solution, was found to be sufficient for one nerve, but 200 c.cm. could be used without harm, and produced anaesthesia lasting from one and a half to two hours. Analgesia was produced about a quarter of an hour after injection. In order to ensure complete paravertebral anaesthesia, 0.01 to 0.02 gram of morphine, or 0.0002 to 0.0004 gram of scopolamine, was injected half an hour or an hour before the injection of the novocain-suprarenin. The point of injection for the sacral nerves was 2 cm. from the middle line on each side of the coccyx. The second, third, and fourth sacral nerves are found by running the finger along the interior of the rectum, while the sacrum is palpated by the point of the needle. Sacral anaesthesia was used for amputations of the upper part of the thigh and operations on the lower part of the abdomen; 50 to 70 c.cm. of a 1½ per cent. solution of novocain-suprarenin are injected into the spinal canal at the sacrum. This was less frequently employed in field-hospital work than paravertebral anaesthesia, as unsatisfactory results were more frequent from it, and because it took longer to produce anaesthesia—twenty to twenty-five minutes. For operations below the middle of the upper leg the usual peripheral infiltration method of anaesthesia was employed with success; 20 c.cm. of a 1½ per cent. solution was injected into the great sciatic nerve, 10 c.cm. into the anterior crural and the obturator nerves. Generally speaking, for operations below the knee-joint only the great sciatic and anterior crural nerves were injected.

20. Wanderings of a Shrapnel Bullet in the Circulation.

A. GRANDGÉRARD (*Paris méd.*, January 13th, 1917) says that although the frequency of late and distant migrations of foreign bodies through the human tissues has long been known, it is still difficult, except in the case of needles, to picture to oneself with some probability the mechanism of these displacements and the paths followed by the wandering body. Perhaps the number has been exaggerated, and before the discovery of the *x* rays the conclusion may have been somewhat hastily reached that migration had taken place when it was impossible to locate precisely the first situation of the missile. The author, in more than 4,000 radioscopic examinations, several hundreds of them carried out on soldiers wounded at least a year before and already previously radioscoped, has seen only two cases of spontaneous displacement of a projectile. One of these he records in detail. A soldier aged 20 was wounded on April 10th, 1916. A radioscopic examination was made on April 17th, when it was found that the wound was situated in the posterior part of the left supraclavicular region at the edge of the trapezius. Slight local pain was the only symptom. On the screen there was seen at the level of the right auricle a very opaque foreign body of the shape and size of a shrapnel bullet. This mass was subject to rapid and regular movements having the character of an elliptical vortex. The man was made to turn slowly round with the view of making sure that the missile was really inside the heart; it was never seen to project beyond the cardiac area. A little more than an hour later, he was again placed on the

radioscopic bed when, to the great surprise of the author, no sign of the missile could be seen either at the level of the heart or anywhere in the thorax. Examination of the abdomen and the pelvis was negative, but at the level of Scarpa's space the same shadow that had been seen in the right auricle was visible. The man was then completely undressed and examined, but no wound or scar was found in that region. On further examination a few minutes later the shadow had again disappeared, but it was readily found in the pelvis at the level of the right sacro-iliac joint. The examination was discontinued at this point, lest the missile should go back in the opposite direction along its track. During all these examinations the patient felt no pain or discomfort. The stages in the migration of the projectile—right auricle, Scarpa's space, sacro-iliac articulation—led the author to think that it had followed the lower vena cava and reached the femoral vein, passing thence into one of the iliac veins. Three days afterwards an operation was performed; immediately before it was begun radioscopic examination showed that the projectile had become slightly displaced. It projected on to the sacrum, a little to the inner side of the middle of the right sacro-iliac symphysis. Through a median abdominal incision the surgeon felt the bullet roll under his finger in the hypogastric vein below the ala of the sacrum; it was fixed in that position by the calibre of the vein. Hampered by the intestinal coils, the operator gave up the idea of opening and suturing the vein at that depth. He made many fruitless attempts to bring the projectile into a more accessible part of the vessel, and at last decided to tie the vein below the projectile to prevent any further displacement. On June 17th, two months after the operation, the man showed no circulatory disturbance, and felt no pain. Grandgérard cannot explain how the bullet going in at the left shoulder penetrated into the right auricle. But he demonstrated to several witnesses its presence in that situation and its successive displacements; finally its intravenous situation was shown by laparotomy. He concludes that a large foreign body, free in the right auricle, can be carried into the blood stream without the migration being revealed by any objective or subjective phenomenon. The possibility of this occurrence must not be overlooked by the surgeon who attempts to extract a projectile by direct operation on the heart; to avoid disaster he should operate under radioscopic control.

21. Late Opening of Arteries in Projectile Wounds.

RAYMOND GRÉGOIRE (*Arch. des maladies du coeur*, November, 1916) writes on late opening of arteries in wounds caused by projectiles. By this term he understands ruptures occurring fifteen to thirty days after the injury. The artery does not rupture in its whole circumference, but is perforated by a lateral orifice sometimes oval, sometimes irregular in shape. The sheath of connective tissue is generally thickened, whilst the cellular sheath has disappeared. Haemorrhage may present three different aspects. It may come on suddenly, and cause death if immediate treatment is not available; it may be slow, insidious, and repeated, running later the course of a big haemorrhage; or it may come on gradually in the interior of the tissues, and assume the form of a diffuse aneurysmal haematoma. These phenomena, therefore, differ from those of the secondary haemorrhages observed in anfractuous and infected wounds. It is important that they should be known, as there is nothing by which their appearance can be foreseen unless it be the position of the orifices of entry and exit, and the direction of the track in the neighbourhood of a large artery. In several cases the author was able to tie the large arterial trunks (primary carotid, femoral, humeral) which were bleeding without any ischaemia manifesting itself in the surrounding parts. In another paper on lesions of arteries by projectiles Grégoire (*Paris méd.*, July 1st, 1916) says that the opening of arteries, immediate or late, leads to bleeding. When this is immediate, as is the rule, it generally causes death in a few minutes. If it is delayed, which is the exception, the haemorrhage, very slight at the moment of the wound, is reproduced in considerable amount some hours or days later. When late, which is rare, the haemorrhage is all the more serious, as there is nothing except the site of the wound to give rise to fear of its occurrence. It is produced two or three weeks after the receipt of the wound by escharosis of the contusioned arterial wall, and comes on either suddenly or gradually, or in repeated bursts. Obliteration of the arteries may be immediate if it is a case of tearing or crushing of the tissues by large fragments; or it may occur ten to forty-eight hours after the wound, in cases of small lesions when the artery is only bruised, but thrombosis is produced later. If the circulation is not re-established, ischaemia and necrobiosis may result.

OBSTETRICS.

22. Delivery through Shell Wound.

SAINT, GOELINGER, AND POIRÉ record (*Journ. de méd. et de chir. prat.*, January 10th, 1917) the case of a woman six months pregnant in whom delivery was brought about by a remarkable accident. She lived in a region occupied by the British and constantly bombarded, and was sitting at a window when a shell exploded in the street and wounded her in the lower abdomen. When brought to the hospital it was found that the belly was very painful and palpation was so difficult that it was impossible to determine the position of the fetus. An aperture of entry was found a little below and to the left of the umbilicus, and that of exit at a distance of nine centimetres from the left crural arch. On palpation it was found that the abdominal muscles were completely divided and that only a bridge of skin was left between the two apertures. The patient was bleeding abundantly through the vagina. The bridge of skin was cut through and laparotomy was performed. On the fundus there was found a wound of about five centimetres through which was seen the lumbar region of a fetus showing a small wound. The wound was enlarged, when the fetus was easily delivered; the pelvis, which was full of meconium and amniotic fluid, was cleaned, and the operation was completed by careful haemostasis and suture of the uterus. The case ran a normal course and the mother made a rapid recovery. As for the child, which was left unattended to as it was believed to be dead, it soon began to cry and to show itself very much alive. It weighed 950 grams; but as no incubator was available it died in fifteen hours. The authors say that this is probably the first case in the present war in which the Caesarean operation has been done by the explosion of a shell. [We may recall, however, that in the BRITISH MEDICAL JOURNAL of December 4th, 1915, it was stated that Dr. Henrot had not long before given to the Paris Académie de Médecine an account of the bombardment of the hospital at Rheims. The maternity patients were by way of precaution moved to the cellars; one of the women was delivered by the action of a shell, which tore open the abdomen and uterus; the child had simply to be extracted. This may, of course, be the same case as the one reported by Saint, Goelinger, and Poiré, but as Henrot speaks of a "fine child" having been presented to him, while in their case the child was premature and died in a few hours, it seems more probable that there have been two war accidents of the same kind.]

THERAPEUTICS.

23. Electrargol in Epididymitis.

MARIO GIORDIANO, surgeon-captain in the Italian Navy, records (*Annali di Med. Navale e Coloniale*, 1916) the results obtained by him in the treatment of epididymitis by the injection of electrargol into the inflamed part. The following is the procedure: The diseased testicle being immobilized with the left hand, the epididymis is pushed towards the point of a needle introduced by the right hand. The syringe and the needle are first sterilized by boiling and the scrotum is disinfected with tincture of iodine. An ordinary glass syringe holding 2 c.cm. with a needle of medium calibre are sufficient. The best plan is first to introduce the needle alone so as to make sure that no vessel has been struck. In this way it is often possible to extract a small amount of the inflammatory liquid; this by lessening tension makes the injection more bearable. The syringe, filled from small ampoules with 2 c.cm. of isotonized electrargol, is then fixed to the needle and the injection slowly made. Sometimes rather sharp pain in the testicle and cord radiating towards the joints of the same side is complained of. The pain ceases in a few seconds, and is greatly mitigated by a previous hypodermic injection of morphine. In six sailors treated by Giordiano in this manner the effects were very rapid. The pain existing before the injection rapidly diminished and ceased in from eight to ten hours. Fever, even if high, often fell on the first day after the injection; it never lasted more than twenty-four hours. The tension of the tissues disappeared gradually in three or four days and the constitutional symptoms improved at the same time as the local resolution. In some cases seen months after the treatment the organ had recovered its normal appearance without any indurated nodules. The evolution of the disease is greatly shortened; the average period of rest required was in severe cases from five to six days and in ordinary cases forty-eight hours. The dose injected varies from 1.5 to 2 c.cm. In one case the injection had to be repeated after two days.

AN EPITOME OF CURRENT MEDICAL LITERATURE.

War Number.

MEDICINE.

24. Symptoms of Nervous Heart.

KURT SINGER (*Medizinische Klinik*, November 19th, 1916) considers nervous heart to be the most common of all the nerve troubles among soldiers. It is characterized by paroxysmal palpitation, sharp pains in the left breast, an irregular pulse, the frequency of which is altered by the patient standing and lying down; but the heart sounds are normal. Sleeplessness, fainting, dizziness, paleness or flushing, increased activity of the various reflexes, fluttering of the eyelids, and trembling of the hands, are all experienced by the patient. The blood pressure is found often to be below 90, or even 70 mm. Hg. Two symptoms found of great value in diagnosis were (1) the presence of hyperaesthetic zones in the heart region; worked out by Head, Mackenzie, and by Brasch. "Head's zones" (elliptical zones), hyperaesthetic to pin-pricks, are rarely, if ever, present in organic heart disease, while fairly constant in nervous heart. They do not exactly correspond to the point of greatest pain felt by the patient; but the point of greatest sensitiveness is frequently situated near the apex beat. In cases examined by Singer the hyperalgesic zone never reached beyond the sternum, or the right boundary line of the heart, and the point of greatest pain was always in the region of the apex beat. In 22 cases investigated Head's zone was found unmistakably in 14 cases; the hyperaesthesia affected only the pain sense, and never the temperature sense. In patients recovering from dysentery and typhus fever hyperaesthetic zones had been found round about the umbilicus and the transverse colon. Sympathetic irritation and vasomotor excitation were frequently exhibited in the nervous heart by symptoms of tachycardia, arrhythmia, blushing of the face, and sweating. Vagus irritation was manifested by slowing of the pulse ("negative chronotropic working"). Irritation of the sympathetic was generally exhibited in patients suffering from nervous heart, so that nervous heart with a slow pulse Singer considers to be unusual, perhaps impossible. Deep expiration causes a slowing of pulse by reflex vagus irritation; deep inspiration a rapid pulse by reflex sympathetic irritation; this did not always hold good in the nervous heart—of 22 cases 7 had similar pulses in expiration and inspiration, and 5 greater frequency in expiration. This symptom can only be taken as an expression of some vagus or sympathetic irritation. A method of investigation suggested by Erben many years ago had been found most useful. When the patient was crouched down with the head bent forward a sudden slowing of the pulse was felt, succeeded in three-quarters to one minute by the normal beat. This was the vagus pulse produced experimentally, and was akin to the slowing of the pulse in deep expiration, for breathing was arrested when the patient crouched, and he remained in expiration as long as he could. The vagus pulse could also be produced by causing the blood to run to the head. In healthy people this test ("the cerebral vagus pulse") was hardly ever positive; it was invariable in patients suffering from shell shock with severe nervous heart attacks but no organic disease. In some cases the pulse-rate slowed almost to half. This slowing of pulse was found in neurasthenics who did not suffer from the symptoms of nervous heart.

25. Simulation of Skin Disease by Soldiers.

F. DE NAPOLI (*Morgagni*, January 13th, 1917) has observed a number of cases of pemphigus occurring simultaneously among the Italian troops at the front in a manner suggesting a true contagious form of the disease. The favourite sites of the eruption were the legs and the feet, especially on the extensor aspect; in some cases the arms and the face were affected; in one only the back. Both lower limbs as a rule were attacked; when only one was affected it was almost always the left, from the middle third to the foot, sometimes involving the sole. When the eruption was confined to the right lower extremity the lesions were mostly in the anterior tibial, the external malleolar region, the dorsum, and the sole. The mucous surfaces were always unaffected. The elementary lesions were mostly bullae, sometimes with a sharply oval, at others with an irregular spherical or linear configuration. They varied in size from a hazel-nut to a turkey's egg; in rare cases they were as large as the palm of the hand. The bullae were for the most part intra-epidermic, sometimes subepidermic; exceptionally they were rupial in character, involving the papillary layer and the derma. They were generally distended by a lemon-yellow liquid, in some cases opalescent, never haemorrhagic, rarely purulent. They were surrounded by a narrow red halo, sharply circumscribed, and without trace of inflammatory reaction. Alongside of this eruption, constituted mostly by epidermic bullae resembling those of pemphigus, was a dermatitis characterized by small vesicles, in some cases confluent, in others spread over large erythemato-papular scabs, resembling eczema. This difference of morphological aspect was regional; it was not seen on the legs, but only as a solitary manifestation in a few individuals on the orbit and the face, where secondary folliculitis of the beard was scarcely ever missing. The affection began in all the cases in the same way: absence of general prodromal symptoms; no malaise or fever; slight local itching, mostly at night; then in a few hours, almost always in the morning on awaking, appearance of bullae, generally painless. In all cases the eruption came out at once, not preceded or accompanied by pyrexia. Fever came on after some days only in the exceptional cases in which the bullae had a rupial character, and in which there was formation of pus. In some cases some erythematous patches were seen among the bullae; it was therefore possible to follow their evolution to the vesicular or bullous stage. Sometimes after two or three days the bullae when not pricked burst and emptied themselves spontaneously, leaving the derma exposed. The duration of the dermatosis, except in cases in which suppuration or concomitant gastro-intestinal symptoms occurred, was eight days; the usual termination was complete repair of the epidermic layer. From this general statement must be excluded some cases in which, through the inoculation of pyogenic organisms, large and deep ulcers were produced; in these cure took place by granulation. The affection, owing to the absence of topographical characters and symmetry, cannot, says the author, be classed among the forms of pemphigus of nervous origin. On the other hand, the absence of injury excludes traumatic pemphigus. Nor can any internal cause be admitted, because none of the men had taken any alimentary or medicinal substance capable of producing such an eruption; besides the agents, such as antipyrin, bromine, iodine, etc., which cause cutaneous eruptions, produce a dermatosis with lesions which are disseminated, not almost confined to the lower limbs and always polymorphous. The afebrile course, the evolution from a single outburst, the distribution limited to certain regions, the favourable issue, the absence of similar cases among the officers and non-commissioned officers of the regiments in which the dermatosis occurred as well as among the civil population, exclude acute epidemic pemphigus, which is a very severe affection, almost always ending fatally. Chronic pemphigus is also excluded by the ages of the men, the epidemiological characters of the disease, the immunity of the mucous membranes, and the absence of relapse. These facts led the author to think of some external agent as a causative factor, all the more as nearly all the men affected came from the same district. The *Ranunculus acer* is the only plant abounding in that district that is capable of producing pemphigoid acrodermatitis. Experimental application of the leaves to the skin produced an affection exactly similar to that observed in the soldiers. Hence the author concludes that the dermatosis studied by him was an artificial pemphigus. The situation of the lesions on covered parts (legs and feet) made it impossible that they could have been due to accidental contact. The author concludes that they were produced by the men themselves with the object of securing exemption from service.

26.—MARIANO CARRACCIO (*Giorn. di Med. Militare*, Fasc. xi, 1916; *Medicina Pract.*, January 31st, 1917) has seen

in the dermatological department of the Ospedale Umberto I of Rome numerous cases of acute dermatosis occurring in an almost identical manner in more than one hundred soldiers. Many of the men came from the country districts near Rome, where they had been at home on leave. Instead of returning to duty they reported themselves sick either at the railway dressing station or directly at the principal military hospital. Others came from dépôts with a diagnosis of various skin diseases, not seldom with one of an exanthem such as measles. There were no symptoms of general reaction or visceral disturbance. By the confession of some of the men it was found that the eruption was produced by the application of vegetable substances to the skin. These were either the pounded root of *Daphne gnidium* or the juice of the cactus leaf. They were applied by light friction over the whole body, sometimes on circumscribed parts on the limbs or the trunk; unlike what happens when mineral acids, croton oil, or ethereal oil of turpentine are used for the same purpose, they did not cause any change in the general condition nor severe local pain. The cutaneous eruption begins as an erythema, generally intense but confined to the part to which the irritant has been applied. This erythematous stage reaches its full development about twenty-four hours after the application, and is quickly followed by a papular phase in the form of more or less accentuated bulging of the mouths of the cutaneous follicles with infiltration and induration of the follicles themselves. If this erythematous phase persists and assumes the aspect of an acute toxic erythema or a lichen tropicalis, then in almost all the cases very numerous small superficial acuminated vesicles, with more or less abundant purulent contents, are formed. In some cases these pustules tend to become confluent and to form a small purulent superficial phlyctenule. This pustular phase, which occurs more readily on hairy surfaces, is due, according to the researches of Zanelli in the Institute of Hygiene directed by Sanarelli, to the virulent action of the *Staphylococcus pyogenes aureus*. The duration of the affection corresponds to the intensity of the eruption, the phase of development which it reaches, and the resistance of the skin to the action of the irritant. This resistance is in direct relation to the general nutrition. The men affected were all treated with repeated applications of an oil prepared according to the following formula: Pure phenol 1 gram, camphor 5 grams, vaseline oil 100 grams. By this means in from three to eight days the inflammatory process was arrested and the reddening of the skin disappeared. In the vesiculo-pustular phase the purulent exudate dried up in a short time, forming small yellowish-brown crusts. The infiltration of the follicles subsided more or less quickly, but in the majority of cases, even when the redness of the skin had disappeared, they showed as raised points, brownish in colour, corresponding to the opening of the follicles. In a case of this dermatosis produced experimentally by a medical student in the department by the application of cactus juice on the extensor surface of the forearm, although the action was carefully limited, bulging of the follicles was observed for about seven days and the brownish colour persisted for twenty days with discrete furfuraceous desquamation.

SURGERY.

27. Gunshot Wounds of Abdomen.

E. Liek (*Arch. f. klin. Chir.*, cvii, 1916; abstract in *Surgery, Gynaecology, and Obstetrics*, January, 1917) says that all surgeons went to the front with the conviction that abdominal wounds would not, as a rule, be operated on. MacCormac's aphorism after the Boer war, that "all those shot through the abdomen will live if let alone, and will die if operated," was generally accepted. The experience of the present war soon showed that conservative treatment was almost hopeless. The most striking feature among the men with belly wounds was the strong contrast between different patients. Some presented the hopeless picture of impending death, which occurred within twenty-four hours; others diagnosed as "shot through the stomach" showed no sign of serious injury, but were sitting about and eating heartily. The difference is explained by the fact that one man pulls through, not because his presumed stomach injury has been treated conservatively, but because his alimentary canal has not been injured; the other dies because he has a perforated wound of the stomach or intestine. There is a difference in prognosis between gunshot wounds of the upper abdomen and those of the region below the umbilicus. In Liek's opinion the prognosis of gunshot wounds of the abdomen in the field hospital depends on whether or not the alimentary canal has been perforated; in other words, the threat of peritonitis dominates the situation. The most important symptom of peritoneal irritation is the reflex tension of the abdominal wall. This, however, is found in other conditions, and in doubtful cases the surgeon should enlarge the wound and examine. In Liek's field hospital service during the first fourteen months of the war, 2.5 per cent. of the wounded had gunshot injuries of the abdomen. Of these, 55 per cent. died; others were transferred to base hospitals. About one-third of the non-operated cases eventually recovered. Gunshot wounds of the liver have an apparently favourable prognosis, similar to that of injuries of the upper abdomen when treated conservatively. Liek has seen seventeen cases in which spontaneous recovery took place. According to his experience it seems certain that the modern small calibre bullets can pass through the liver from a very short range without causing irreparable mischief. The clinical course of gunshot wounds of the liver varies considerably. Smooth, completely penetrating shots end most favourably. Tangential shots are less favourable; they are similar to tangential wounds of the skull. Liek observed some in which clear liver wounds complicated with injuries of the kidney and other organs healed spontaneously. Altogether he saw only twenty-seven cases of liver injury, these representing 13 per cent. of the men admitted with the diagnosis of gunshot wound of the abdomen. But he thinks that liver wounds are more frequent, as in eleven abdominal cases examined *post mortem* there were injuries of the liver besides those of other organs. In seven of the twenty-seven cases the diagnosis was made by the outflow of bile through the wound. Liek lost eight of his patients (29.4 per cent.) in the field hospital. Korte's figure is 60.8 per cent. But Liek says it would be fallacious to infer from his low percentage that the prognosis of liver wounds is better than that of other abdominal injuries. While in these the risk of peritonitis is the predominant factor, in liver injuries haemorrhage is the danger. But it is not the only one. Concomitant injuries of neighbouring organs, especially the right lung and the right kidney, may endanger life owing to necrosis, abscess of the liver, thrombosis of the large blood vessels and secondary haemorrhage; these complications are responsible for many deaths. Liek summarizes the treatment of gunshot wounds of the liver as follows: Simple clear-through shots will recover with rest and morphine. Free haemorrhage calls for inspection of the wound and plugging or suture of the liver as may be necessary. In tangential shots, especially from artillery, the irregularly torn sinus must be exposed, bone splinters of ribs and all necrotic tissue removed, and the wound loosely packed. Complications in the pleura and later complications such as liver abscesses must be treated according to general surgical principles. In dealing with liver wounds, as with other abdominal injuries, success depends upon early treatment. Liek cites several examples of the favourable results obtained by immediate intervention in wound of the liver.

28. Gunshot Wounds of the Stomach.

Richard Fibrich (*Wien. klin. Woch.*, October 19th, 1916) states that statistics of stomach wounds show that operation was successful in all cases in which recovery was probable, and that when death resulted after operation the wounds were so severe that recovery could not, under any circumstances, have been expected. All the cases of death from stomach wounds brought to hospital died before operation, and in no case in which, for various reasons, operation was not performed, was recovery heard of. In October, 1915, two cases were operated upon in hospital, and since then they had passed through a reserve hospital in fit condition. All stomach wounds, he thinks, ought to be operated upon by a well-qualified surgeon as soon as possible after the receipt of the wound, when a stationary hospital and complete asepsis are available. Cases had been received with a doubtful diagnosis of pelvic, pulmonary, or stomach wounds, which turned out to be serious perforations of the stomach or gut. Every clearing station should have at least one skilled surgeon, who should act only in that capacity.

29. Wounds in the Present War.

A. U. Desjardins (*Journ. Amer. Med. Assoc.*, January 6th, 1917) reports observations made in the present war, and describes the wounds received. Moist climate and intensively cultivated soil are ideal conditions for infection of wounds, and to this must be added the necessary delays, which were more marked in the beginning, and caused

complications very difficult to meet. At the present time many of the field hospitals at the front are equipped with every essential. The rush of cases at times is very great. A French surgeon at the Somme front, in charge of a field hospital of 2,000 beds, had 600 wounded pass through his hands in thirty-six hours. Another working behind the Verdun front had, with a colleague, to perform 400 operations under shell fire in an underground ambulance on the front line. At the first dressing station no operations are performed. The wounds are examined and dressed and the patients are sent back to the nearest field hospital, where they are given one or more doses of tetanus antitoxin. The wounds are explored and drained, accessible foreign bodies removed, fractures temporarily splinted, and all patients fit to be moved are transported by motor ambulance to the nearest evacuation hospital, where the needed additional treatment is given. They are then sent as soon as possible by train to the base hospitals at Paris or other cities. During the first weeks of open fighting the number of bullet wounds was comparatively high, but since that time a large proportion of the wounds have been caused by shells, shrapnel, bombs, or grenades. Bayonet wounds are rarely seen, because, inflicted at close quarters, they are generally fatal. The effect of the rifle bullet depends largely on the distance from which it has been fired. The frequency of explosive effects observed in such wounds received in the trenches is accounted for by the short range. At short range extensive shattering of large bones is produced by the bullet, and fragments are driven through the surrounding soft parts. Clean perforations of bones are rarely seen. Shell fire is largely of two kinds, shrapnel and high explosive. The latter is far the more destructive, innumerable jagged fragments being forced through the tissues, tearing off pieces of clothing and carrying them into the deepest portions of the tissue. The sudden violent explosion of one of these shells also causes more or less shock, which is sometimes fatal. The general infection of all the wounds may be of many kinds. Tetanus is not so frequent as at first, but the dreaded gas infection is still one of the problems of military surgery. The type of wound in which the rapidly spreading form is observed is the deep wound in which the projectile, instead of widely tearing the muscles apart, has lodged in some muscle mass, as in deep wounds of the thigh. The infection may be so intense as to overwhelm the patient in a few hours. To combat the infection is the principal problem, and Desjardins reviews the theories and methods of Dakin, Carrel, and others. No one method is applicable to all cases. The first indication is thorough exploration of the wound, removal of foreign bodies, excision of sloughs, and free drainage. At this stage continuous irrigation is of distinct value, because it dilutes the discharge and facilitates drainage. The use of antiseptic solutions is advised if the wound can be thoroughly made accessible to their action. At Ris-Orangis different antiseptic solutions were used on different batches of patients. There seemed to be no great difference in the power of the different antiseptics when the wounds were properly drained, but it was evident that continuous irrigation should give way to dry dressings after the acute suppuration had subsided. Prolonged continuous irrigation seemed to produce oedematous flabby granulations and retard the healing process. Badly comminuted fractures, complicated by infection, should be thoroughly drained and all loose detached pieces of bone removed, but pieces not thoroughly detached should be left in place. Amputation should be a measure of last resort. The treatment of gas infection depends on the stage of the condition when first seen. If there is only a limited amount of distension, the first indication is to lay open the infected area by multiple free incisions and remove all foreign material. After ample drainage has been provided for, continuous irrigation may be tried, but if the gas crepitation continues the limb should be removed at once. If the infection is situated in the thigh, the limb should be amputated at or near the hip bone. Subfascial injections of oxygen gas or peroxide have not given encouraging results. "The greatest lesson to be learnt from the surgery of this war can be summed up in two words, 'intelligent conservatism.'"

30. Wounds of Vessels.

POTHERAT (*Réunion méd. chir. de la IVe armée*, August, 1916; *Arch. des maladies du coeur*, November, 1916) says there are many cases in which a blood vessel has been wounded haemorrhage is either absent or only moderate in amount and in which the lesion may be overlooked until a time when, the obstacle to bleeding (clot, projectile, etc.) having been removed, it suddenly comes on, presenting the usual features in respect of gravity and abundance. Owing to the frequency of these occurrences the author advises that, in cases where the projectile is judged by the point of penetration and the direction of the wound to have traversed a vasculo-nervous bundle or passed close to it, the surgeon should, even if there be no sign suggesting vascular lesion, as far as possible behave as if this were certain—that is to say, he should seek for the vessel and act accordingly.

31. Middle-ear Lesions from Aerial Commotion.

A. SAUPIQUET, who was in charge during six months of the service of otology of the N° French Army Corps, had the opportunity of observing a considerable number of lesions of the auditory passage due to commotion, explosion of shells, mines, etc. (*Rev. de Laryng.*, etc., December 31st, 1916). Receiving those patients direct from the trenches, and being able to examine them within two days of the injury, he was able in most cases to note accurately the onset of the affection and the development of the lesions; on the other hand, as the most serious cases had to be evacuated in a few days he was unable to follow the later course. He had not therefore the opportunity of studying cases of labyrinthine commotion with or without objective lesions. The only point about them which he had occasion to note was the relatively small proportion of them in injuries of the middle ear; of 164 cases of ear affection produced by commotion only 26, or about one-sixth of the number, were instances of commotion of the labyrinth associated or not with lesions of the middle ear. Saupiquet divides the affections of the middle ear produced by commotion into three classes: One, including twenty-four cases, showing at the first examination a perforation of the tympanum, sometimes small, sometimes rather extensive, always with more or less ragged edges, sometimes more or less complete destruction of the membrane, which might be accompanied by more or less free bleeding. In the ensuing days the condition tended to cure without infection of the middle ear, the lesions gradually cicatrizing, often with complete restoration of the membrane if there had only been a perforation of small extent; on the other hand, if there had been a true bursting of the drumhead, wide loss of substance remained. If there were infection of the tympanic cavity, otorrhoea came on within the first two or three days. Sometimes it was a mere mucous or muco-purulent oozing, sometimes a true purulent otitis. The author noted this suppuration in eighteen of twenty-four cases belonging to this class, whilst in six the lesion healed by primary cicatrization. In the second class, which included thirty-two cases, the lesion first seen was not a perforation, but a simple attrition of the tympanic membrane; at the first examination there was seen a slight intratympanic haemorrhage, often along the handle of the malleus, sometimes at the level of Shrapnell's membrane; in some cases there was a small haematoma. In a few days this haemorrhagic lesion gradually disappeared, leaving a normal drumhead, or it might become transformed into a perforation. It seemed as if in these cases, the attrition being deeper, a mortification of the tissues, causing a secondary perforation, was produced. The author has seen this secondary perforation in twenty cases, generally three or four days, sometimes as long as a fortnight, after the beginning. It has no resemblance objectively to the primary perforation directly due to the wound characteristic of the first class; it is not a tear or a bursting of the membrane, but a small lenticular perforation with thin sharp edges at the seat of greatest contusion. The evolution of the perforation may also, according to circumstances, follow one of two courses—either it cicatrizes quickly without suppuration, or a slight serous or sero-purulent discharge comes on; or, as is most commonly the case, a true purulent otitis media is developed, generally two or three days after the perforation. The cases in which the tendency is towards cure without suppuration are much less numerous in primary than in secondary perforations (6 in 24 cases belonging to the first class; 10 in 20 of the second class). This, the author thinks, may be explained by the fact that in the former class septic matters are projected by the explosion into the middle ear at the same time as the perforation is produced, whilst in the second treatment during the first days makes relative asepsis of the auditory meatus possible. To the third class belong cases which at the first examination, on the day following the injury, there was seen a purulent discharge, a true traumatic otitis media coming on suddenly. In these the author says he was not able, as in the others, to catch in the act the pathogeny of the phenomena; it merely seemed as if they were cases of traumatic perforation in which infection was more rapid after

the projection of more septic products. Summing up, Saupiquet from the pathogenic point of view divides tympanic lesions caused by commotion into: (1) Laceration or bursting—primary perforation; (2) contusion of the drumhead, often bringing about secondary perforation through necrosis of the tissues. Discussing the question whether it is the varying force of the commotion of the air that causes the difference in the lesion or whether the pre-existing condition of the auditory canal should not also be taken into account, the author says that E. J. Moure has shown the importance of the previous state of the ear in the production of lesions of this kind. It is, of course, difficult, in patients not known to the surgeon before they were wounded, to judge of the previous condition of the auditory tract, but the author has been struck by the relatively large number of various nasal lesions among men with injury of the ear. Of 164 cases treated there were 80 with nasal lesions: among these were 27 of deviation or spur of the septum, 18 of polypus, 28 of hypertrophic chronic rhinitis or nasopharyngeal catarrh, 5 of ozaena, and 2 of nasal syphilis; as most of these conditions predispose to affections of the ear, these figures suggest the existence of previous lesions of the ear. On the other hand, the presence of a thick plug of cerumen in the meatus has often seemed to Saupiquet to act as a powerful protection to the tympanum. While generally the men were wounded almost equally on the two sides, he noted in ten cases that one of the ears in which there was a plug of wax was absolutely intact, whilst the other, without such protection, showed serious tympanic lesions. In this Nature gives a clear hint as to a useful method of prophylaxis. When the lesions have gone on to suppuration, whether following a primary or a necrotic perforation, the evolution is the same; the affection runs the course of a subacute otitis media, generally benign, and yielding to ordinary treatment after three to five weeks, and inducing an impairment, usually not very marked, of the hearing. Here again the previous condition of the auditory tract is of capital importance. Whilst in men in whom the previous state was normal the rule was recovery in two, three, or four weeks; on the other hand, in six cases in which an old suppurative otitis media was quickened into activity by the injury, interminable suppuration refractory to all sorts of treatment occurred.

32. X-ray Appearances in Gas Gangrene.

AGNES SAVILL (*Arch. Radiol. and Electr.*, December, 1916), as the result of examining sixty-seven radiographs at the Scottish Women's Hospital at Royaumont, and comparing the bacteriological reports and the surgical findings, is able to suggest certain *x*-ray appearances which denote not only the presence of gas in the tissues and its extent and situation, but also the variety of the gas infection. Three totally different appearances were observed on the plates, and with few exceptions these corresponded to three different varieties of anaërobes: (*a*) Simple swelling with a pale misty outline, sometimes fading a little in indefinite areas much as a white fog fades in a landscape. This form was found when *B. perfringens* was the chief organism, and was probably due to the oedema. (*b*) A cloudlike outline, in addition to the swelling, as if the flesh were replaced by dark woolly clouds, an aspect due to infiltration of the tissues by the gas. In some of these cases round or oval dark outlines were observed, where the gas was sharply demarcated. This diffuse cloudiness, by far the most common type of appearance, was, in the great majority of cases, associated with *B. perfringens* and *B. sporogenes* together. (*c*) The rarest form, a striated appearance, occurred in two types: (1) A fine striation in which the dark lines of gas infiltration mapped out the individual muscle fibres in such a definite manner that the plate resembled a drawing of the muscles of a limb; (2) a coarse striation, usually associated with considerable swelling, occurring in limited areas, the lines of division being straight and always seen in a longitudinal direction. In one of the two cases in which fine striation was found the *Vibrion septique* and *B. perfringens* were present in the depth of the muscles and in the blood; in the other case *B. histolyticus* and *B. fallax* were the uncommon organisms present. Both cases proved fatal. In the cases with coarse striation *B. oedematiens* and *B. Hibler IX* were the most frequently occurring organisms. As to the prognosis, the type associated with appearance (*a*) was the most favourable, provided correct surgery was resorted to immediately; in type (*b*) the course towards recovery might be steady after free incisions had been made, but when the cloudiness indicated deep-seated gas, unrecognizable clinically, the outlook was exceedingly serious; in type (*c*) the prognosis, to judge from the author's experience, was very grave. She states that no negative finding should be made on *x*-ray evidence alone, and warns against certain fallacies which may lead to a wrong positive finding: thus appearances due to actual loss of tissue or extensive ecchymosis may be mistaken for the gas condition; and she believes also that abscesses may simulate gas bubbles in the radiographic picture.

33.—MARTIN BERRY (*ibid.*) states that if a wound be merely infected by anaërobes without the formation of gas bubbles, radiology at present can be of no assistance towards diagnosis, but if gas is present in the tissues it can be demonstrated in a well-made radiograph. He furnishes particulars of a number of cases in which a diagnosis of gas formation had been made, and bases upon these his classification of gas formation into two main types: (*a*) That in which there are a small number of discrete bubbles, with individual ones possibly of large size; and (*b*) that in which there is extensive and diffuse gas infiltration. One feature was noted throughout the whole series of 28 cases: whenever there was much gas, *B. perfringens* was found on bacteriological examination. The presence of this particular anaërobe seemed, therefore, to be capable of radiographic diagnosis, though the absence of radiographic signs could not be taken to imply its absence. Fallacies to be guarded against in making a radio-diagnosis of the presence of gas were the similar appearance due to (*a*) loss of tissue, causing an increased radio-transparency of the part; (*b*) bubbles of air trapped within the tissues; (*c*) oxygen bubbles present under considerable tension in cases where the wound had been syringed with hydrogen peroxide.

34. Radiography of the Orbital Region.

STENVERS (*Arch. Radiol. and Electr.*, No. 190, 1916) states that although both sagittal and lateral or frontal reproductions are indispensable in *x*-ray examinations of the skull, radiographs taken in other directions are also frequently essential. When it is desired to obtain a specially accurate negative of some particular region, this plan must often be resorted to. Such radiographs are thought by some to present an indefinite and uncertain tangle of lines, but a closer investigation will show that each particular position of the skull causes certain definite lines to come to light, and their constant recurrence indicates that they are representative of definite anatomical features. The author confines himself principally to the discussion of the foramen opticum and the fissura orbitalis superior. He endorses the method of Rhese, who, in studying deformities of the ethmoid, so adjusts the photographic plate to the face that one edge rests upon the zygoma of the side under investigation, and the other upon the ridge of the nose; this method, the author maintains, is often even more significant for the orbit than it is for the ethmoid. By placing the nose-chin line a little closer to the plate, the fissura orbitalis will easily be found within the sphere of the orbit. To what extent this will occur cannot be stated by mentioning any specific angle, for the length of the nose and the shape of the skull determine its relative position in each separate case. In one instance the nose will have to be more closely approximated to the plate, while in another a smaller degree of approximation will suffice. Moreover, the angle formed by the sagittal axis of the skull and the base will vary within certain narrow limits. Simultaneously with the fissura orbitalis superior, the optic foramen returns within the circumference of the orbit. Each skull by reason of its individual construction will require a particular procedure in order to be photographed, and although this means that an ideal comparison cannot be made between radiographs of various skulls, this is of very slight importance, in the author's opinion, as the comparison of the orbits of different people has little clinical significance, and the only comparative object for the orbit is the other orbit of the same individual, which must be taken in exactly the same manner. The author describes a number of cases recently met with in order to show the practical value of such radiographs for observation of pathological formations in and around the orbit, and one case bringing out the fact that haemorrhage in the orbit can be demonstrated by means of *x* rays. This last was a patient who, in consequence of a bayonet thrust in the right orbit, suffered from total paralysis of all eye muscles on the right side and ptosis of the right upper eyelid. Comparing radiographs of both orbits, a rather sharply outlined blot in the fissura orbitalis of the damaged side was noticeable. In view of the known injury, this blot could only be haemorrhage, and its limitation and direction located it within the hollow made by the converging eye muscles. The author also finds that dimness in the picture of the ethmoid does not always indicate an injury of the bone.

AN EPITOME OF CURRENT MEDICAL LITERATURE.

War Number.

MEDICINE.

35. Localization of Foreign Bodies in the Pleura.

S. GANGI (*Policlinico*, December 11th, 1916), in examining a patient wounded by a shrapnel bullet which was wandering free in the cavity of the right pleura, noted that by methodical percussion at the base of the thorax he could map out a small zone of intense pain corresponding to the temporary position of the foreign body. Six months after the patient first came under observation the symptoms characteristic of irritation of the pleura (dry cough, position in recumbency, etc.) were much diminished, whilst others not present at first—for instance, sighing—had appeared. But the relation between the temporary seat of the projectile and the painful zone at the base of the corresponding part of the thorax was unchanged. By the pain caused by moderate pressure at different points over the base of the thorax the author was able to determine the approximate position of the foreign body, but he was not able to define the limits of the space it occupied. In two other cases the projectile was seen by radioscopy to be fixed in the phrenico-costal sinus. In one the foreign body had caused exudative pleurisy, traces of which remained at the time of examination. In the other the reaction of the pleura was limited to the incarceration of the projectile in the right phrenico-costal sinus. Even in these circumstances it was possible by methodical percussion of the base of the thorax to mark out a very painful zone within which radioscopy revealed the presence of the foreign body. In order to define the position of the foreign body in the pleura the author made the patient stand up or sit on his bed with the arms folded and bent slightly forward so as to leave the circumference of the chest free. The percussion was begun on the paravertebral line. The left index was placed parallel to the long axis of the body with the object of covering with the percussed finger all the area of the complementary space of the pleura (bottom of the phrenico-costal sinus). The author percussed the base of one half of the thorax, following the complementary space from behind forward, and then examining the other half in the same way. Having determined the site of the foreign body by the position of the pain, he proceeded to define the extent of the zone and to map out its limits. Under the guidance of the percussed finger he marked out a line corresponding to the posterior margin of the painful zone. He next sought for the anterior limit, proceeding from before backwards. Having defined these two margins, he placed the left index perpendicularly to the two lines marked out, and, percussing from above downwards, he sought for the upper limit. Proceeding from below upwards in the same way, he determined the lower limit. He then by palpation assured himself that along the course of the ribs comprised within the zone which had been defined there were no lesions that could explain the pain. The constancy of the results of radioscopy in the three patients led him to the conclusion that the method described affords a good guide for the diagnosis and localization of foreign bodies in the pleura.

36. Simulation of Skin Disease by Soldiers.

AT a meeting of the Riunioni Medico-militari Castrensi R. RIVALTA read a communication giving particulars of 100 cases of what he calls "cutaneous pantomimicry" (*Policlinico*, March 4th, 1917), which had come under his notice from November, 1915, to October, 1916. In 43 the artificial lesions were eschars and sores, in 20 eczematoid dermatoses, in 20 suppurating and phlegmonous dermatoses, in 9 bullous dermatitis, in 8 hard traumatic oedema. The number would have been still greater had the cases in which there was a suspicion of simulation which could not be verified been included. To these must be added some which were not recognized. In all the cases reported the lesions were produced by the external application of a chemical irritant, or less frequently heat, or by direct injury. The seat of election of the eschars and sores, which constituted about one-half of the total, was the lower limbs, especially the feet. Eczematoid dermatitis was most often seen on exposed surfaces, such as the cheeks and the concha of the ear; the lesions varied from scarcely perceptible abortive forms to the most acute processes with great oedema of the whole face, closing the eyes and giving the patient an appearance "at once monstrous and comic." The phlegmonous lesions were situated almost exclusively on the lower limbs, most frequently the left; repeated applications of the irritant generally caused multiple foci of inflammation in different stages on the same limb, the process going beyond the intention of the malingerer, who was frightened at the self-inflicted damage to his tissues. The bullous lesions were situated on the feet, and were always said to have been caused by scalding with boiling water; it was difficult to determine whether they were accidental or artificial. The lesions produced by boiling liquids are generally multiple phlyctenulae or bullae with a thin pellicle; they contain a fluid serous transudate, and have polycyclic outlines. On the other hand, those caused by blistering fluids are mostly bullae few in number with a thick pellicle adhering to the contents which are almost gelatinous; their outline is generally an unbroken curve of large radius. The hard traumatic oedema is most frequently seen on the back of the hands, especially the left; there were never any signs of contusion (ecchymosis, etc.), and the lesions had sharp outlines, especially at the roots of the fingers; they were of hard elastic consistence and not very painful. They were produced by repeated injuries mitigated by the interposition of pieces of cloth; sometimes they were caused by irritant liquids. Oedema of the feet accompanying the first stage of frost-bite was doubtless in many cases due to constriction by tight drawers, garters, and puttees, but it was impossible to determine whether such constriction was deliberately caused in order to produce swelling of the limb or was brought about accidentally by wetness of the garments. The diagnosis of the artificial character of a skin affection generally amounts only to medical conviction, not to legal proof. In five cases, however, the author identified the agents employed; in two cases the discovery was confirmed by the confession of the simulators that they had used pieces of the root of a sort of leek (*porracca*) common in Sicily.

SURGERY.

37. The Selection of an Antiseptic.

PHILIPOWICZ (*Wien. klin. Woch.*, October 26th, 1916) speaks well of the use of hyperol in suppuration due to anaërobic organisms, and for the prevention of gas gangrene. It is a compound of hydrogen peroxide and urea, rendered stable by the addition of a trace of citric acid. When small pads of gauze containing hyperol powder are put into a wound cavity oxygen is slowly liberated. Uninjured tissues are not attacked, and the patient seldom complains of pain. Considerable leucocytosis occurs, and the growth of aërobic organisms is stimulated. If pus formed, free drainage was found to be necessary. In cases in which there was necrosis of tissue with little pus formation, balsam of Peru was used to promote local leucocytosis. Oxidizing agents also were found useful in the treatment of bone cavities and to stimulate growth of granulations. Tincture of iodine was used for routine skin disinfection in all simple wounds, the wound being first cleaned by washing with benzine. In hernia of the brain, which is assumed to be a symptom of encephalitis, tincture of iodine was particularly useful on account of its antiseptic and drying properties. To promote separation of the devitalized portions of the brain Scheide painted the protruding part energetically with tincture of iodine at each change of dressing, and of 250 cases so treated all did well. In abscess of the brain, or foul penetrating wounds, he irrigated the brain with very hot water, and either injected tincture of iodine or inserted gauze drains soaked in the tincture. To prevent the spread of infection from the skin or from infected parts of the brain, gauze soaked in tincture of iodine was laid around the protruding part. Philipowicz treated frost-bite

of the third degree and other forms of incipient gangrene, such as bedsores, by tincture of iodine and a particular preparation of bismuth subgallate called dermatol; the interdigital folds were painted with iodine and the subgallate shaken on. Small pads of gauze saturated with iodoform were placed between the digits and the whole affected part covered with one fold of gauze. For shallow cavities hot potassium permanganate solution was found useful. In wounds infected with *B. pyocyaneus* mercuric oxide solution, 1 in 1,000, was found very useful. A solution of camphor 60 parts, liquid carbolic acid 30 parts, absolute alcohol 5 parts, was used with success in suppurating affections of joints after tapping, and it was found that the injection might be repeated in a few days; iodoform emulsion was also useful for the same purpose, and the two preparations might be used alternatively. Alcohol was used for personal disinfection before operating, and corrosive sublimate for cleansing rubber gloves during an operation.

38. Migrations of Projectiles in the Circulation.

V. ASCOLI records a case in which a projectile lying free in the right atrium of the heart found its way into the inferior vena cava (*Malattie del Cuore*, January 1st, 1917) which may be compared with that of Grandgérard, in which a missile migrated from the heart to the pelvis (see EPITOME, February 17th, par. 20). A soldier, aged 22, while walking along a trench on the Isonzo front on July 18th, 1915, was struck in the back by a shrapnel shell. He was knocked down and could not move, but did not lose consciousness; he felt intense pain radiating to the left leg. After treatment at a clearing station he was transferred on July 23rd to a hospital at Pavia. On admission there was found a deep wound on the back, 5 to 6 cm. long, immediately over the iliac crest midway between the middle and external lines of the body. There was a sense of weight and oppression in the epigastrium, made worse by taking food. From time to time there was severe pain in the belly with borborygmi. A radioscopic examination made on August 1st showed that there was a bullet in the projection of the left ala of the ilium at its middle point. At a second examination made on September 1st no trace of the bullet, which at first was quite distinct, could be found in the area indicated, but on exploration of the thoracic cavity a small black shadow, round and movable, was seen in the cardiac area. This was confirmed by repeated examinations, which showed that there was a round projectile about 7 to 8 mm. in diameter in the right auricle. The foreign body made rhythmical, pendulum-like movements of about 2 to 3 cm., synchronizing with the contractions of the auricle. This pendulum swing was interrupted at intervals in the middle; at the internal limit of its course the projectile was caught up in a whirling movement, which carried it back to its starting point. The wound ran a very protracted course, long periods of apyrexia being interrupted by slight rises of temperature, with exacerbations of the local phenomena. A purulent discharge continued to ooze from the wound, and from time to time fragments of clothing were extracted, the last time being on October 24th. Healing was complete in December, 1915. Summing up the observations made from August 10th, 1915, to July 10th, 1916, Ascoli says that during the last three or four months of that period the patient might have been looked upon as a perfectly healthy man but for three large patches of *area Celsi* on the scalp attributed to nervous shock. After discharge, although he lost flesh a little, there was no disturbance of the circulation or respiration. About the end of October he was examined radioscopically at the military hospital of Udine, and the report was that the projectile was still in the right auricle, and that no new condition was discoverable. Radioscopic examination showed that the heart was normal in configuration, size, and position. There was no sign of pericardial adhesion. There was a dark shadow on the right part of the heart area above the lower border. It was perfectly round, oscillated in a transverse direction with pendulum like movements subject to sudden arrests, which threw the shadow back to the starting-point; these interruptions occurred with a certain regularity in every four to six oscillations. At such moments the shadow seemed to be caught up in a vortex. By modifying the order and depth of the respirations it was found that the whirling movements interposed among the rhythmical oscillations synchronized with inspiration and up to a certain point were proportionate to the depth of the inspiratory acts. Therefore, while the regular movements of the shadow were in relation to the cardiac revolutions, the intercalated movements were in relation to the inspirations. The shadow presented the same movements alike in the erect and the dorso-ventral position. Ascoli says projectiles may reach the cavity of the heart either directly by traversing the myocardium or indirectly by one of the great veins. The pericardium may be traversed without any great damage, but most frequently inflammation with serofibrinous-haemorrhagic exudation (which may be absorbed, leaving adhesions) is set up or a more or less abundant effusion of blood takes place. The functional disturbances and lesions vary according to these occurrences. Lesions of the myocardium always cause irregularity and weakness of the heart and often alarming collapse. The period in the cardiac revolution at which the myocardium has been wounded is important; wounds being more dangerous when the affected cavities were full (by reason of the easier and more copious haemorrhage) and especially when they were full and contracted (rupture of the heart occurring in such circumstances). Foreign bodies reach the heart by the blood vessels less frequently than by the direct path. In Ascoli's case it followed a long track from the point where the inferior cava originates in the confluence of the two iliac veins to the right auricle. It had been suggested that the missile first discovered at the level of the iliac crest was not the one afterwards seen in the heart. Ascoli replies that to prove this it would have to be shown, first, how the image seen at the first examination disappeared, and secondly, where but through the original wound a body of the dimensions of a shrapnel bullet could have penetrated, seeing that there was no lesion or cicatrix in the thorax or any other part of the body. The only doubt that can exist is, given the initial position of the projectile, whether it entered the left iliac vein at the point where it debouches into the inferior vena cava or penetrated directly into the latter vein. This point however, which cannot be settled without *post-mortem* examination, is of no clinical importance. In the interval between the first and second radioscopic examination the patient was, on account of pain in the loins, kept lying in bed without a pillow, and therefore with his head low; thus the conditions were most favourable for the migration of the projectile. While the passage of the projectile from the inferior cava into the heart is beyond question, the manner in which it penetrated into the vessel without causing haemorrhage or other serious consequences remains to be explained. The wound was deep and tortuous; it gave rise to mild but obstinate suppuration; it is therefore likely that by inflammatory action there formed around the missile a connective sac from which it slipped into the vessel. If after allowing the entrance of the projectile the vein (left iliac or lower cava) had remained wholly or in part temporarily impervious, the blood stream would have found a collateral path through the azygos system. The absence of circulatory disturbances except some slowing of the pulse is explained by Ascoli by the supposition that the bullet became covered with fibrin. Discussing why a bullet in a cavity of the heart did not follow the blood stream, he suggests that a band of connective tissue may have bound it to the cardiac wall. As regards prognosis, Ascoli asks whether the contact of the foreign body with the walls of the heart may not in time cause changes inducing disturbances of the valvular mechanism or progressive lesions in the myocardium. No categorical answer can be given. But the formation of thrombi seems more probable. Another danger is the migration of the foreign body into the left atrium or the right ventricle; in the latter case it may easily give rise to plugging of a branch of the pulmonary artery. The presence of a foreign body in the right atrium is therefore dangerous for many reasons, and notwithstanding the absence of perceptible disturbance, one should be prepared for developments of extreme gravity. Ascoli would have decided on surgical intervention, but in view of the man's general condition, especially in respect of the respiratory apparatus, he thought that operation would certainly be followed by death. He therefore contented himself with reconstituent treatment and careful supervision, verifying at intervals the position and mobility of the projectile. No untoward incident occurred during the eleven months the man had been under observation at the time of writing.

[A summary of experiments by Achille Monti on the migrations of pieces of lead introduced into the veins and the consequences of their passage into the heart will be found at paragraph 44 of this number of the EPITOME.]

39.—At a meeting of the New York Surgical Society on October 25th, 1916, H. H. M. LYLE (*Annals of Surgery*, December, 1916) showed a heart, a shell fragment, and a vein with the following history: A Zouave, aged 31, was brought to the dressing station four hours after having received a perforating shell wound in the left thigh 4 cm.

above the knee and a penetrating wound of the right thigh. A fluoroscopic examination of the thigh and abdomen failed to reveal any foreign body. The depth and direction of the wound seemed to exclude the possibility of the fragment having fallen out. The man was in a state of mild shock. The contused skin edges were cut away, the wound laid open, and the projectile track lightly but methodically excised. No foreign body was found. At the bottom of the wound in the right thigh the femoral vessels were embedded in a blood clot; the femoral vein was bruised but apparently intact. Four Carrel instillation tubes were inserted and 20 c.cm. of Dakin's solution were delivered to the wound every two hours. On the third day the patient's belly became greatly distended, and he complained of pain and tenderness over the spleen and right kidney. The distension was partly relieved by lavage and enemas. Jaundice appeared on the morning of the fourth day and was accompanied by pain and tenderness over the liver. The temperature rose to 102.2°, the pulse to 132, the respirations to 32. Fine moist râles were heard at the left base. The area of cardiac dullness had increased, a distinct pericardial rub was heard and the heart sound was indistinct. A provisional diagnosis of general gas bacillus infection with pericarditis and pneumonia was made. In the afternoon there was a temporary improvement followed by sudden death. The wound remained sterile all through. The *post-mortem* report stated that the wound in the right thigh was 10 cm. below and 5 cm. posterior to the anterior superior spine of the ilium. The track went forwards, downwards, and inwards to the femoral vein; in the external wall of the vein there was a small valve-like wound sealed by an organized clot. There was no local evidence of gas infection. Both lungs were oedematous; there was fibro-purulent pericarditis with free gas in the pericardial cavity. The heart was enlarged and its external surface covered with a fibro-purulent exudate. The cut section of the heart gave a gaseous crepitation. Lying free in the right ventricle was a rough fragment of shell measuring 1.5 cm. in length, 0.9 cm. in width, and 0.5 cm. in thickness; it weighed 1.81 grams. Fibres of clothing adhered to the irregular surface of the shell. The liver, spleen, and kidneys were enlarged; on section all gave gaseous crepitation. There was no obstruction in the gall bladder or ducts. The final diagnosis was perforating wound of the left thigh, penetrating wound of the right femoral vein, and migration of the projectile to the right ventricle of the heart and general gas bacillus infection. Lyle thinks the following points worthy of notice: The carrying of a rough shell fragment by the blood stream from the right femoral vein to the right ventricle and the prolongation of life for four days and eighteen hours; the healing up of the wound in the vein; the sterilization of the local wounds by the Carrel method, the generalized gas infection having undoubtedly arisen from the clothes in the shell fragment. A fluoroscopic examination of the upper abdomen might have revealed the presence of the projectile. It would then, Lyle thinks, have been easy to "milk" the fragment into an unimportant vein from which it could easily have been removed. This has already been done in the case of a shrapnel ball. [No reference is given.]

40. Wounds from Aerial Torpedoes.

G. KELEMEN (*Muench. med. Woch.*, December 12th, 1916) has described the features of aërial torpedo wounds. The torpedo is spindle-shaped and 15 to 20 cm. (6 to 8 in.) long. The amount of the explosive charge is great compared with the thin shell of the torpedo, which breaks up into minute fragments, some as sharp and fine as needles. The characteristics of the wounds were determined by the shape and size of these fragments and by the concussion following the explosion of a large charge at close quarters. Not infrequently as many as fifteen or twenty wounds, mostly superficial, were found on the same person. When they had been inflicted with considerable force they resembled fine stab wounds, but were not sufficiently penetrating to pass through a limb or to fracture a long bone. The only fractures observed from this projectile were fractures of the ribs, and in one case three ribs were divided as if by a knife. The skin was cleanly cut, not bruised. It was very difficult to locate these fine fragments at a first dressing station, and in two cases of multiple abdominal wounds it was impossible at first to say whether the abdominal wall had been penetrated to the depth of the intestines or not. In one case a clean cut of the femoral artery soon proved fatal. The skull was never pierced, and the wounds of the head were little more than scratches, but superficial and deep wounds of the eyes were fairly common, as were lacerating wounds of the face. The sudden and great changes of atmospheric pressure caused by the explosion resulted in shock, ranging in intensity from slight dizziness to prolonged and complete unconsciousness. Less characteristic were the wounds caused by earth, clothing, and other foreign bodies driven into the body.

41. Gunshot Wounds of Head.

RICHARD FIBRICH (*Wien. klin. Woch.*, October 19th, 1916) states that as *x* rays were not available at the clearing station in which he worked an operation was not undertaken in cases of head injury unless a freely open wound was present. In such cases a gauze drain was inserted and the wound closed around it; the gauze was removed in three or four days. All other penetrating wounds of the skull were passed on to the division hospital, where they were sorted, moribund cases were treated with morphine and superficial splinters removed; in favourable cases discharging wounds were cleaned up under a local anaesthetic. Penetrating wounds were sent away after the first shock had passed (in one or two days), but those operated upon were retained until they showed signs of improvement (ten to fourteen days). Of 361 wounds, eighteen were operated upon in the clearing station. Of three cases of penetrating wound, two died, and one, involving the mastoid process, recovered. Of fourteen open wounds, five died, seven were discharged improved, and two as recovered, one of them being passed for service. One case of splintered wound, produced by a grenade, recovered.

THERAPEUTICS.

42. Treatment of "Gassing."

CHASSEVANT (*Journ. de méd. et de chir. prat.*, March 10th, 1917) describes a method of treatment of "gassing" by means of which he obtained satisfactory results. The patients reached his ambulance, which served as a front line evacuation hospital, from two to eight hours after the injury. Some had already been treated in clearing stations or in other ambulances; others came direct from their places in the field. They were treated at several successive sittings by rhythmical inhalations of oxygen under pressure. Chassevant observed that inhalations of oxygen applied in the usual way with indiarubber balls have no effective action; there must be a veritable insufflation of oxygen, such as is employed by d'Arsonval for the treatment of poisoning by carbonic oxide. An indiarubber tube directly connected with a cylinder containing oxygen under pressure, such as is kept in most pharmacies, is passed into the back of the mouth, and by opening and closing the stopcock of the cylinder sharp and rhythmical insufflations, fifteen to sixteen per minute, are produced. This treatment relieves the difficulty of breathing, favours haemostasis, and seems to supply a real mechanotherapy for the lung. Those who have been poisoned by chlorine fumes in the laboratory or in the field know how painful inspiration becomes; inhalations of oxygen under pressure make this effort needless. For the relief of cardiac weakness Chassevant combines with the oxygen subcutaneous injections of camphorated oil in massive doses, 5 c.cm. to 15 c.cm. and more, every twenty-four hours, according to indications. The use of oxygen under pressure is the true antidote to intoxication of the lung by ensuring aëration. It is put up for the purpose in small cylinders which are easily handled. Chassevant argues that all ambulances, especially the clearing stations, should have a supply of these ready at hand; they should also be held ready in dug-outs, as grenades for dealing with fires are kept.

43. Extemporized Protectives against Asphyxiating Gases.

LOMONACO (*Malattie del Cuore*, March 1st, 1917) says it has been proved that many common substances which are generally available (straw, hay, grass, earth, snow, fresh leaves, seaweed, sawdust, coal dust, cotton, especially if damp) have the property of absorbing to a certain extent the gases used for asphyxiation. They may therefore be used as means of protection by the soldier who is suddenly exposed to gas, when he has not his mask ready or when it is not working efficiently. In such circumstances he should throw himself on the ground and cover his face with a handkerchief, plunging his head into any of the above-named substances that may happen to be at hand; he should use it in as large a quantity as possible and press it tight to his face with his hands. In mountainous

districts he will find snow and in the trenches he will nearly always be able to get earth, or he can burst open a sandbag.

PATHOLOGY.

44. Wanderings of Projectiles in the Veins.

ACHILLE MONTI (*Malattie del Cuore*, March 1st, 1917), with reference to Ascoli's case (summarized in this issue of the EPITOME, par. 38), has studied experimentally in dogs and in the dead body the migrations of pellets of lead introduced into veins, and the consequences of their passage into the heart. He introduced into the veins of large dogs fragments measuring from 5 to 10 mm. in diameter, and ascertained that in the living and in the dead animal the projectile once having reached the right auricle very readily passed into the ventricle, and thence into the pulmonary artery. In his first experiments he aimed at reproducing the phenomena noted by Ascoli in the case recorded by him (see par. 38). Having introduced fragments of lead measuring from 5 to 8 mm. in diameter into the common iliac veins of large hunting dogs, he noted that the foreign body easily found its way into the vessel as if it were sucked up by it. Nevertheless he never succeeded in making the fragment reach the heart by that path; in the first dogs operated on he found the projectile nestling in the liver within the lumen of a suprahepatic vein and forming a retrograde embolus without having reached the right auricle. The same experiment was repeated with the animal tied on its back for more than two hours after the operation. It was then killed and the fragment was found to have passed beyond the heart and to be arrested by a branch of the pulmonary artery. Monti next studied on five dogs the effects of projectiles introduced into the jugular vein and passing into the lung. In three cases he introduced one round fragment, in a fourth two foreign bodies, a bullet and an irregular piece of lead, and in a fifth two square pieces of lead. Radioscopic examination was made at intervals varying from some days to two hours after the operation. He found the foreign bodies in the lower lobe of the left lung. The emboli therefore had forced the tricuspid valve and passing through the right ventricle proceeded till they were arrested in a branch of the pulmonary artery. Many radiographic examinations of the left lung were made, and the projectile was definitely recognized moving with the respiratory movement. From the constancy of these results the author concluded that in the healthy dog embolism of the pulmonary artery is not followed by infarct of the lung and the subdivisions of the pulmonary artery act as anastomotic, not terminal, branches. To discover whether attached projectiles would show the same whirling movement described by Ascoli in his case, Monti introduced into the jugulars of dogs pellets of lead about 5 to 10 mm. in diameter with thin silk threads passed through them. In four cases he succeeded in finding the suspected fragment in the lumen of the right auricle moving in the blood with the contractions of the heart. In one of the dogs killed after a week the autopsy showed the projectile covered with a fine layer of fibrin which was also deposited around the thread; in this were numerous white corpuscles which seemed to tend to involve the thread itself. In the other dogs, which survived after a period of ten to fifteen days, the projectile, on radiographic examination, was no longer seen in the auricle, but was found to have already passed into the left lung. Autopsy confirmed the radioscopic diagnosis. The thread had broken off close to the fragment. In two other dogs, after a fortnight, the following conditions were met with: In one the bullet was fixed to the wall of the auricle; in the other it was embedded among the columnae carneae at the base of a papillary muscle covered with fibrin in course of organization. A dog which had one or two bullets in the branches of the pulmonary artery seemed to be healthy, and could even bear the fatigues of the chase with a resistance equal to that of normal dogs. From experiments on dead dogs Monti concluded that in the dead human body spherical bullets introduced into the internal iliac vein may be carried to the right heart, but do not pass beyond the auricle. The experiment goes to show that a bullet, free in the right auricle, meets with serious difficulties in its course towards the ventricle, because its weight makes it difficult for it to overcome the obstacle presented by the Eustachian valve and the leaflets of the tricuspid. In Monti's opinion the experiments show that projectiles, especially those of spherical shape, once they have penetrated into the veins, proceed in the direction of the heart with relative facility. They may reach the heart either by direct wound or by an embolic process. Recent observations in field surgery show that the heart is not less tolerant of penetration by foreign bodies than other viscera. This is shown by the various cases of penetrating projectiles which have remained in the heart without giving rise to appreciable disturbances, objective or subjective. He appends a bibliography referring to about 70 cases operated on for gunshot wounds of the heart.

45. Fermentation Reactions as an Aid in the Rapid Diagnosis of V. cholerae.

THE identification of cholera-like vibrios isolated from the faeces in suspicious cases of intestinal infection is a matter of the highest importance on account of the epidemiological significance attaching to the true *V. cholerae*. Specific agglutination by means of a powerful immune serum is the method of diagnosing the true cholera vibrio on which reliance is usually placed. But in a proportion of cases the test may be misleading; there are two reasons for this—first, cholera bacilli may become inagglutinable as the result of sojourning for several weeks in the living body or when they live in water for a time. The power of being agglutinated by the antiserum does not then return until they have been frequently subcultured; it is then rather late to make a diagnosis. A second difficulty is that sometimes cultures which turn out not to be true cholera are agglutinated to a considerable extent by the true cholera antiserum. GAEHTGENS (*Cent. f. Bakt.*, I Abt., Bd. 78, 1916, p. 197) has attempted to clear up the question by the investigation of the fermentation reactions of the true cholera vibrios and the allied organisms. He finds that true *V. cholerae*, when recently isolated, produces a marked acid reaction in mannite, dextrose, maltose, levulose, and saccharose, which changes to alkaline after five to seven days in the case of mannite, and after ten to fourteen days with the other substances; exceptions to this behaviour are rare; on the other hand, the cholera-like vibrios produce an alkaline reaction in three to seven days. Accordingly, any organism which produces alkali in the shorter period in these tests is not likely to prove a true cholera culture. In connexion with this work it must be remembered that so long ago as 1909 Houston, in his fourth research report to the Metropolitan Water Board, made use of the early fermentation reactions for the identification of true *V. cholerae*.

46. Causation of Trench Foot.

VICTOR RAYMOND and JACQUES PARISOT (*C. R. Acad. des Sciences*, January 22nd, 1917) bring forward further evidence to show that "trench foot" is due to prolonged immersion of the lower limbs in cold water, no cases having occurred in trenches which were not under water. They note that Arabs and negroes were peculiarly susceptible, and suffered severely from symptoms pointing to a condition of septicaemia, high fever with wide oscillations, marked adynamia, and even collapse, a red dry tongue, fetid diarrhoea, and epistaxis. These symptoms sometimes passed away but were sometimes followed by nephritis with copious albuminuria, pulmonary congestion, bronchopneumonia, grave jaundice, and even death. At the necropsy no intestinal lesions of any kind were found, but enlargement of the liver with whitish nodules of perihepatitis, enlargement of the spleen, bronchopneumonia, and generalized punctate haemorrhage of the lungs and enlarged kidneys, might be found. In one case the visceral parenchyma contained mycelial threads readily visible on smear preparations and in histological sections. The bile of the first of these patients, inoculated under the skin of a rabbit, gave rise in twelve hours to a big blister, soon followed by a black slough. The bile of the second patient produced the same effects and the animal died in three days. Control experiments with the bile of healthy animals proved innocuous. Haemoculture revealed the presence of mycelial germs in the blood in five out of ten of the more serious cases, and also mycelial threads in the local lesions. The lesions never attained this gravity in Europeans. In them *Scopulariopsis konigii* and *Sterigmatocystis versicolor* were found, but in the dark-skinned races Mucor. *Penicillium glaucum* was common in both. Experiments on animals showed that usually inoculation did not give rise to any lesion, but if the hind legs were inoculated and kept in water for some time there resulted a gelatinous oedema, followed by sloughing. War conditions have reproduced those of Pasteur's famous "chilled fowl." Stagnation in cold water is at the root of the evil, in that it enables the infecting agent to pass through the sodden epidermis.

AN EPITOME OF CURRENT MEDICAL LITERATURE.

War Number.

MEDICINE.

47. Simulation of Disease.

EDGARD BLUM, médecin-aide-major de 1re classe, in the *Journal Médical de Bordeaux* (December, 1916), describes a number of the devices known under the slang name of *carotte*, used by malingerers in the French army. The *carottier* of to-day, he says, is often very intelligent and frequently utilizes for his purpose the most recent scientific discoveries. The doctor must always distrust men who come wearing glasses without necessity and bandages of every kind, with their pockets full of more or less authentic documents. They exhibit marks and scars, all of old standing, which are the sole evidence of the diseases they profess to be suffering from, and they complain of strange symptoms belonging to no known clinical type. Inflammation of the throat produced by irritant solutions is a frequent fraud; but there is no febrile disturbance and the inflammation is not localized in the tonsils, but extends over all the parts which have been in contact with the irritant. Gastric disturbance is often produced artificially by the ingestion of a mixture of oil and tobacco; it may be accompanied by tachycardia and even jaundice. This device is easily exposed by the administration of ipecacuanha. Diarrhoea is common; it is simulated by diluting the stools with urine and water. The suspect should be isolated in a room with two receptacles, one for the faeces, the other for the urine. Dysentery is simulated by the addition to the diluted faecal matter of pig's fat or fragments of raw meat. Appendicitis is often complained of; the malingerer has heard of pain at MacBurney's point as a symptom, but his knowledge goes no further, and thus he is readily detected. There are men with tapeworm who drive a regular trade in the segments they expel. A method of producing jaundice much in favour is to smoke a mixture of antipyrin and tobacco in a pipe and to drink tobacco juice; the simulator of the present day prefers picric acid, as described by Chavigny (EPITOME, vol. ii, 1916, par. 25). Haemoptysis is produced by pricking the back of the throat with a pin, or by the absorption of blood from the tongue, gums, etc., and even from chickens, geese, etc. This blood is then expectorated by a violent fit of coughing. Sometimes the appearance of blood is produced by colouring matters, such as carmine or beetroot juice. Careful local and general examination, with the aid of the microscope, and chemical tests if necessary, will reveal the fraud. Simulation of heart disease is rare, as "doping" is known to be dangerous. Albuminuria and oedema may be produced in predisposed subjects by taking large quantities of common salt in milk for some days. Another method is the injection of albumin into the bladder. Glycosuria can be produced by the ingestion of phloridzin or ammonium oxalate, or the addition of glucose to the urine. These substances should be sought for in the urine obtained at an unexpected moment. Incontinence of urine is "a veritable scourge for the urological centres." The detection of the fraud is not always easy. The genuine sufferer empties his bladder about the middle of the night; the simulator a few minutes after waking. Uteau and Richardot have invented an apparatus which records the hour at which the bladder is emptied. Lesions of the skin and subcutaneous tissues are produced by irritants and infective matters; they are situated on parts easily reached by the simulator. Intense erythema may be caused by scratching; nettles, euphorbiaceous plants and radiant heat are also used for the purpose. Drug eruptions (mercury, arsenic, iodides, bromides) are frequent, but are readily checked by isolation and rigorous supervision. Impetigo may be produced by the application of cantharides plaster and tartarized antimony ointment. The lesions quickly disappear on withdrawal of the injurious substances, with a few baths and a short rest. Sweating of the feet is sometimes simulated by softening the soles with prolonged hot footbaths; excoriation is then easily produced, and the feet are afterwards wrapped in linen steeped in urine. Oedema of the lower limbs is produced by tight bandages, etc. Suspicion should always be aroused when a man comes bearing the marks of recent constriction. In some parts of Lombardy many cases of oedema with febrile symptoms occurred at certain seasons. Their artificial origin was discovered only after prolonged investigation. It was discovered that the plant *Equisetum arvense*, also called astringent herb or horse-tail, was introduced between the fingers or toes, and the parts afterwards vigorously rubbed every day for some time; this produces a painful inflammation and considerable swelling, which is made worse by a tight bandage. Abscess is most commonly produced by the introduction under the skin of septic matters (tooth tartar, etc.). The subcutaneous injection of turpentine or petrol is another trick. Artificial lipomas and other tumours may be caused by the subcutaneous injection of paraffin; such swellings rapidly disappear under very hot applications. Artificial conjunctivitis is produced by placing ipecacuanha powder, pepper, faeces, or other decomposing matter under the eyelids. The affection is often refractory to treatment. Discharges from the ear are produced by introducing urine or some irritant chemical substance into the meatus and allowing it to remain there. An appearance of general debility, with loss of flesh, pallor, etc., may be induced by taking a large amount of vinegar. The abuse of strong tobacco and the introduction of garlic into the anus give an anxious look to the countenance suggestive of disease. Arsenious acid, lead, and mercury are also used to cause loss of strength. At the present day epilepsy is less often simulated than used to be the case because signs are now known which cannot be simulated; for instance, the sphygmometer shows that for an hour and a half after a fit the tracings have marked ascending curves, with pronounced dicrotism. Simulated fever is easily detected by taking the temperature in the rectum. Malingerers often complain of disturbances which they attribute to the presence of projectiles left in their bodies, and on radiographic examination a bullet or other foreign body is actually discovered. But it has been introduced by the man himself, generally by the mouth. Examinations made at different times will reveal the fraud.

48. Simulated Conjunctivitis

AT a meeting of medico-chirurgical societies in a camp hospital in the Italian war zone on October 30th, 1916 (*Policlinico*, January 31st, 1917), G. SBORDONE, ophthalmic surgeon to the Second Army Corps, presented a communication on simulated conjunctivitis, in which he enumerated the most common means of producing the condition and its essential symptoms. The ricinus seed seemed now to be the substance preferred by malingerers. The symptoms produced by this agent are oedema of the eyelids, which may be of normal colour or slightly reddened, abundant purulent secretion, swelling and thickening of the palpebral conjunctiva; at some points of the lower lid whitish striae (small eschars) are seen. At first there is no formation of nodules, follicles, or granules on the tarsal conjunctiva, or on the plica semilunaris, but there is marked chemosis of the bulbar conjunctiva, forming a ring around the cornea, sprinkled with numerous reddish points. In very advanced stages the upper portion of the conjunctival sac participates in the change, but the cornea remains unaffected. The subjective symptoms are very slight. The *modus operandi* is generally the introduction of a fragment of the seed into the inferior fornix. In the way of treatment simple lotions are sufficient.

SURGERY.

49. Transplantation of Bone in Injuries of Skull.

ALBERT E. MORISON (*British Journ. Surgery*, January, 1917) says that one of the after-effects of wounds of the present war will be the large number of men from whom a portion of the skull bone has been removed. The majority are unfit for further military service, and are handicapped for civil life. Even when the skull opening is small and the brain area beneath the missing bone is such as to cause no pronounced local manifestations, there has

been in most of the author's cases a sequence of symptoms which, if not relieved, make the patient morbid and self-conscious, and sometimes even threaten insanity. These symptoms are: (1) A feeling of insecurity and nervousness, especially fear of a blow on the affected part; (2) giddiness, more noticeable when stooping or turning quickly; (3) headache and throbbing in the head after exertion; (4) general malaise, apathy, and depression; (5) partial or complete loss of consciousness without any accompanying epileptiform seizure. The symptoms have been associated with adhesions of the dura mater to the pericranium or scalp; but when these have been freed, and the attempt has been made to prevent further adhesions by some membrane, such as interposed fascia lata, the troubles have not been entirely relieved. Some alteration doubtless takes place in the cerebral circulation after loss of portions of the skull, and this may produce the symptoms enumerated. The only effective and lasting remedy seems to be restoration of the skull as far as possible by a bone-grafting operation. Autoplastic grafting gives the best results. The anterior and internal surface of the tibia is the most accessible part from which the graft can be taken. As a rule it is not advisable to operate within three months of the healing of the original wound, as so many infected wounds, even when they appear to be soundly cicatrized, have imprisoned in them foci of latent sepsis. When these are disturbed suppuration follows in the newly made wounds, and failure of the operation is likely from this lighting up of infection. Before operation in these cases Morison applies radiant heat locally to the scar; if any latent sepsis be present it is shown by inflammation in the scar. In some cases the scar breaks down, allowing of the escape of a little pus. When operation has been decided upon, the following are the details of the procedure: (1) A horseshoe-shaped incision, with the base downwards, extending about an inch beyond the opening in the skull, is made through the scalp only, and the flap thus made is separated from the pericranium and reflected downwards. (2) The pericranium is incised round the opening about an eighth of an inch from its margin, the outer portion is separated from the skull about an inch all round, and the inner portion adherent to the bony edge is freed from it so that a periosteum detacher may pass under the skull between it and the dura mater round the opening. The pericranium adherent to the dura in the centre of the gap is thus freed at its margins, and lies between the brain and the bone transplant when the latter is placed *in situ*. The dura is not opened unless there have been attacks of general or local epilepsy, or the brain cannot be felt pulsating over the whole exposed area. These are indications that the thickened dura may have to be removed and replaced by some membrane such as fascia lata. (3) The outer table of bone is removed for about half an inch round the skull opening. The object is to make a ledge on which the new bone graft rests. This can be done with a large, very sharp gouge, chipping vertically round the opening, the outer plate being removed with a smaller gouge from the edges horizontally. The rough pieces of bone left on the ledge are easily removed by gouge chipping. Morison uses ordinary joiner's gouges and chisels. (4) Measurements with a pair of compasses are then taken of the size of the tibial graft required. The head wound is covered up with a mop wrung out of hot saline solution, and a vertical incision is made over the tibia down to, but not through, the periosteum. The whole width of the tibia is exposed, and the periosteum is excised about an inch longer than the bone required, reflected to that extent, and laterally to the full width of the tibia. It is important not to take the crest of the tibia in removing the graft, because if that is removed the tibia is so weakened that a slight accident may cause fracture. The tibia is sawn on each side to the depth corresponding to the thickness of the outer table, the upper and lower limits are chiselled to the required depth, and the portion of bone, with periosteum attached, is finally removed with a wide chisel. (5) The graft is next trimmed with nibbling forceps to the required shape. Where the opening is long the graft may need to be divided in its middle transversely (leaving the periosteum intact) to make it correspond to the curve of the skull; and when two pieces of bone are needed to fill in the gap transversely, the graft, taken longer for the purpose, is divided, and the two pieces are placed side by side. The adjoining periosteum of each piece is then stitched together with a fine continuous catgut suture. (6) The tibial graft is laid on the ledge of the inner table; the separated pericranium is stitched with interrupted catgut sutures to the periosteum of the graft. (7) The scalp flap is replaced, and sutured there with silkworm-gut. The leg wound is closed with Michel's clips. Dressings are applied, and the head tourniquet is removed. Neither of the wounds is looked at for ten days, when the stitches and clips are removed. All the twenty-one patients on whom Morison has operated have recovered very rapidly from the effects of the operation, and all have complained of their leg more than their head. All the wounds healed *per primam*. Union of the graft to the skull appears to be rapid—in ten days it is quite secure—and no absorption of the bone has taken place so far as can be judged from clinical examination and by *x* rays. The author had an opportunity of examining one of the grafts four months after the operation, and it was found that firm osseous union had taken place between the skull and the graft, and that no greater amount of new bone had been thrown out by the graft than was required to cause union to the skull. The general symptoms complained of before operation have disappeared, and some of the men have returned to duty. In all cases the grafted bone remained tender to pressure for from six to eight weeks after operation, but this has gradually disappeared.

50. Treatment of Infected Gunshot Wounds.

JOSEPH RILUS EASTMAN, chief surgeon, Reserve Hospital No. 8, Vienna, says (*Surgery, Gynaecology* and *Obstetrics*, January, 1917) that the following methods of treating infected gunshot wounds are in use in the American Hospital at Vienna: (1) Removal of infected bits of clothing or other infected foreign matter. (2) Wide incision and drainage. (3) Immobilization. (4) Continuous irrigation by the drop method with Dakin's solution of sodium hypochlorite, or continuous immersion in hot antiseptic solutions, as aluminium acetate. (5) Stimulation of lymph drainage with Wright's solution of sodium citrate 1 part, sodium chloride 4 parts, and water 95 parts. (6) Regular and prolonged daily exposure to the rays of the sun. (7) Continuous exposure of all wounds to the air without dressings whenever possible, to avoid foreign body reaction. Small superficial slightly infected tangential wounds are rinsed with normal salt solution or hydrogen peroxide, and covered with balsam of Peru or Mikulicz salve. Of these agents, those which have proved of greatest value are solar therapy; open treatment without dressings; continuous irrigation with sodium hypochlorite solution, composed of dry sodium carbonate, chlorinated lime, boric acid, and tap water. The surgeons have made the following simple classification: (1) Deep wounds with small openings which provide poor drainage; these result usually from impacted rifle or shrapnel balls. (2) Large lacerated wounds involving deep muscles or bone, caused usually by fragments of bombs, shrapnel, or grenade casings and dum-dums. (3) Large and small shallow or crater-like superficial wounds, due to tangential shots or impact of boulders, and large superficial granulating wounds following incision for phlegmon. The wounds in Group 1 are excised or enlarged to afford proper drainage, and at the same time to permit of the removal of bits of uniform, grenade fragments, or pieces of bone. If a limb is involved, an immobilization splint is then applied. During the day the wound is exposed for hours to the rays of the sun, and at other times is irrigated, or covered with a wet dressing of Dakin's solution. In deep and extensive infections excellent results have been obtained by immobilizing the part with a splint in such a manner as to leave the wound exposed. A rubber drainage tube is inserted to the bottom of the wound, and the tube connected with a large receptacle containing Dakin's solution. The solution is allowed to flow into the wound by the continuous drop method. A large hot wet dressing of gauze soaked in the solution and changed twice daily may be applied with advantage around the drainage tube. As a rule, in less than a week the discharge of pus ceases even in the most active infections, and the wound surface is covered with healthy granulation tissue. Foul odours disappear with surprising quickness under the treatment with the sodium hypochlorite solution. Foreign bodies are prevented from coming in contact with the wound by means of square windows or frames cut out of cardboard and made at least one centimetre thick by rolling crêpe paper about the cardboard squares. This protective frame is secured around the wound with adhesive plaster. The open treatment of infected wounds recommended last winter by Braun and since employed in German and Austrian military hospitals by Walzel, Loercher, and others, has in several hundreds of cases proved of great value. Cases of large superficial granulating wound are usually bathed in a copious purulent or sero-purulent, foul-smelling discharge. Such wounds, when treated by the open-air method, often become dry in less than twenty-four hours. The granulations freshen, and epithelialization progresses rapidly.

The solar rays considerably hasten the drying of secretions and stimulate epithelial growth. They also inhibit the growth of many pyogenic bacteria and the contaminating saprophytes. The time of exposure has been regulated according to the comfort of the patient, or according to the degree of chemical erythema or hyperaemia of the adjacent skin. Wounds are at first exposed directly to the sun with no covering whatsoever. If smarting or burning begins, or the adjacent skin becomes decidedly hyperaemic, the wound is covered with a single or double layer of gauze laid upon a wire basket. No ill effects have been traced to the sun treatment. Although dependence has been largely placed upon sunlight and open treatment, together with Dakin's solution for continuous irrigation, frequent use has been made of hot baths in solutions of older and better known antiseptics. Continuous hot baths in solutions of mercury bichloride, potassium permanganate, aluminium acetate, and physiological salt have been used with gratifying results in all varieties of infected gunshot wounds. Continuous immersion lends itself especially to the treatment of injuries of hands and wrist or feet and ankles, as does continuous irrigation to the other parts. As a rule, hot baths allay pain better than sedative medicines. The hot bath in Wright's solution is especially useful in cases in which it is desirable to stimulate lymph drainage, as in cases of diffuse hard cellulitis. These methods for the treatment of infected wounds have been employed regularly in the treatment of amputation stumps. After amputations in serious infections of the extremities, open treatment of the wound has been the rule. Flapless amputation has not been employed. So much difficulty has been experienced in pulling the skin down over the wound surface in amputations without flaps done elsewhere that the surgeons of the Vienna Reserve Hospital thought it wiser to cut short flaps and leave them wide open, to be closed with adhesive plaster straps after the danger of infection has passed.

51. Primary Wound Suture.

COLONEL C. GORDON WATSON, C.M.G., A.M.S., consulting surgeon with the Expeditionary Force, contributes a few notes on war surgery in France to the *St. Bartholomew's Hospital Journal* for April, 1917. He states that within the last six months a far wider field of wound suture has been opened up by the method which he describes, and which, in his opinion, may considerably modify future views on the treatment of wounds. This method includes the use of Professor Rutherford Morison's bismuth and iodoform paste—"B.I.P."—which consists of bismuth subnitrate one part by weight, iodoform two parts, and liquid paraffin sufficient to make a paste. Colonel Watson believes that if the technique advised by Morison is carefully followed, the Carrel method of wound flushing can be dispensed with in many cases. He states that the method seems to be well suited to recent wounds, though in these the amount of paste used should be limited owing to the risk of iodoform poisoning. Professor Morison's initial work was carried out on wounds that reached him seven to fourteen days after infliction. Briefly, the method is to open up the wound thoroughly, and remove with the knife all damaged tissues; the entire wound surface is dried with spirit and thoroughly smeared with paste; the wound is then filled with paste and closed by suture without drainage. Very severe wounds should not, at any rate in the early stages, undergo the extensive operative treatment required by this method. Colonel Watson thinks, as the result of recent experience, that the field for primary suture can be considerably extended with safety by using "B.I.P.," whereby much economy will result not only in time taken up by surgeons and nurses in dressings, but also in the length of time required to effect a cure. Usually there is a moderate though transitory initial rise of temperature, and for the first few days there may be some redness of the skin edges, but pain disappears as if by magic almost at once. There is no need to dress the wound so long as the patient is comfortable. Wounds, though discharging serum freely through the sutures, may be left untouched for weeks at a time except as regards the outer dressings, without delaying progress. When the wounds are dressed for the first time the dressings slip off without pain.

52. Projectiles in the Heart.

PIETRO GILBERTI (*Malattie del Cuore e dei Vasi*, February 1st, 1917) reports a case of projectile fixed in the heart. The patient was wounded in the chest on July 7th, 1916, when lying face downward. He became aware that he was hurt only because he felt blood flowing from the wound. When he came under Gilberti's care, on July 29th, after passing through a dressing station and another hospital, there was a small round wound, painless and almost completely healed, at the level of the right sterno-clavicular joint. Failing to find an aperture of exit, Gilberti sent him to the *x*-ray expert, who reported that there was a shrapnel bullet fixed in the substance of the antero-inferior wall of the left ventricle. The man was kept under observation for about two months. He never complained of any symptom. He got up every morning immediately after the visit and went to bed at night after helping all day to attend on men confined to bed. Radioscopic examination was repeated many times in presence of several doctors, who satisfied themselves *de visu* that the picture always corresponded to the first diagnosis. The case, says the author, is remarkable from the total absence of any disturbance attributable to the foreign body either in the myocardium, the pleura, the lungs, or the anterior mediastinum. The projectile moves rhythmically and independently of the respiratory movement, and even in complete apnoea. Therefore it may be inferred that it is not present in the thoracic wall, nor is it in the pericardium, because on changing the position of the wounded man no change occurs in the position of the foreign body. Nor, again, is it in the cavity of the ventricle, because it does not follow the movement from below upwards as it would if it were suspended in the vortex of the blood. But it has a rhythmical movement synchronous with that of the heart, as if making a part of the cardiac muscle itself, and therefore following it in its slight movement of rotation from right to left. It must therefore be in the thickness of the myocardium. Discussing the absence of haemopericardium and pericarditis, the author suggests that the projectile remained embedded in the wall of the heart and, acting as a plug, stopped by its presence even the small quantity of blood which had escaped from the cardiac muscles. Thus haemopericardium could not be discovered or it was so slight that it was clinically inappreciable. In regard to prognosis, Gilberti agrees with the decision of the medical board which gave the man leave for six months. It would be hazardous to base a prognosis now when precise knowledge of the conditions is wanting. The danger of the migration of a projectile is evident. One of two things may occur—the foreign body may make its way into the cavity of the ventricle, or it may fall into the pericardium and from the pericardium pass to the upper surface of the diaphragm. In the former case there will be a complicated syndrome of heart and lung symptoms, possibly incompatible with life. Haemopericardium may be excluded as a consequence, because not improbably the projectile, wandering into the cavity, will leave behind it the results of a reparative cicatricial process that will prevent the escape of blood. In the latter case excitation of the phrenic centre may result.

53. — SILVAN reported to the Medical Academy of Padua (*Gazz. degli Ospedali*, No. 21, 1916) the case of a soldier suffering from the after-effects of a gunshot wound in the right supraspinous fossa; radioscopic examination revealed the presence of the projectile in the heart. Immediately on receipt of the injury he had fallen into a syncope of short duration; then for some days he bled from the lung, but he never had symptoms of impaired function of the heart or complication of any kind. The wound ran a normal aseptic course and the man was regarded as completely cured and discharged with only a fortnight's leave. On radioscopic examination the projectile—a rifle bullet—was seen lying completely within the cardiac shadow; on antero-posterior examination it was seen localized in the lower third of the heart immediately to the left of the mid-sternal line, turned obliquely towards the apex. On transverse examination it was seen to occupy the antero-inferior third of the ventricular region, lying obliquely below and in front at an angle of about 43 degrees. It presented rhythmical, pendulum-like excursions of some extent, corresponding with the cardiac revolution, without displacement in respiration or change of position. There was nothing notable on objective examination of the heart; the working of that organ was normal even after effort, and the pulse and arterial pressure were also normal. It was thought probable that the projectile occupied the right ventricle towards the septum. Silvan thinks the case illustrates the tolerance of foreign bodies by the heart; this tolerance may be indefinitely prolonged. In these circumstances surgical intervention did not seem to be indicated.

54. Electrolysis in Open Suppurating Wounds.

CHARLES RUSS (*Arch. Rad. and Electr.*, January, 1917) states that electrolysis can be applied to all suppurating areas provided these are such as to permit the superposition of a column of fluid through which the current can flow. Many septic war wounds could be healed in this way without pain and without the irritation of antiseptic solutions. Given an open suppurating surface, an irregular wound, or a sinus discharging pus, the first step is to submerge the lesion in sodium chloride solution, 1 or 2 per cent. This is done in the case of ulcers of the leg, for example, by placing over the ulcer a glass cylinder which is made fluid-tight to the healthy skin by plasticene. A carbon or platinum foil electrode is just submerged in the sodium chloride contained in this cylinder, and under the limb is placed a large saline-soaked pad. The pad is made the negative electrode and the disc over the ulcer the positive, and a constant current of a few milliampères is passed. Thereupon the chlorine atoms become linked to the bacteria in the granulations, and in moving to the positive electrode they carry the organisms out of the ulcer. There is also a strong germicidal effect proceeding within the contents of the glass cylinder, and, further, an increased blood flow is induced in the part. The aim of the electrolysis is to provide a liquid highway (NaCl) for the bacterial emigration from the wound. The author adds that, while the chlorine atoms are carrying the organisms and pus cells out of the blood, sodium atoms, of course, are entering the tissues, and care must be taken that the amount of sodium is not excessive, or the alkalinity set up will be painful and there may be a retardation of healing due to the toxic effect of sodium upon the cell protoplasm. The ideal to be aimed at is to keep the reaction at the body surface neutral or only slightly alkaline. Certain organic acids of rather low conductivity if mixed with sodium chloride are comparatively little decomposed, and if only a small current flows the acid (as such) is free to neutralize the alkalinity of the sodium atoms as they arrive at the cathode. The author concludes that the clinical results so far obtained justify a much more extended use of electrolysis.

55. Meningitis after Brain Wounds.

HART, of Schöneberg, Berlin (*Med. Klinik*, June 4th, 1916), remarks upon how often, long after a brain wound had to all appearances completely healed, symptoms of deep-seated inflammatory, even purulent, processes showed themselves in a lingering illness or a sudden death, while the formation of adhesions over the affected part gave rise to epilepsy; but Bittorf has recently shown that a traumatic meningitis may arise as the result of a wound in the head. It was also found that an infected wound in the brain rarely gave rise to a diffuse purulent meningitis, for the brain substance was prolapsed into the wound in the membranes, and thus the subarachnoid space was closed. Bárány and Chiari, from their military experience, support this statement. It is easy to understand how an abscess may develop deep down in the brain, since that organ cannot be treated like any other, on account of its delicacy. The following case is of interest on account of the small number of cases there are on record of healed brain wounds where the patient has survived: A *post-mortem* examination was conducted on the body of an old woman, aged 61, who four and a half years before had been assaulted by her husband. Over the frontal protuberance at the edge of the hair there was a depressed scar about the size of a shilling, from which ran a linear scar right backwards; a defect in the skull could be felt through the circular scar; round about were little pieces of bone like exostoses; the dura mater was found to be hard and greyish-black, and firmly adherent to the meninges; all over the frontal lobes the meninges were matted together. The adhesions were particularly firm in the region of the falx cerebri, and over the back part of the corpus callosum there was a hard formation like the shot of a 7 mm. revolver. There was no flattening of the convolutions, but the soft membranes were injected, and between the cerebrum and cerebellum yellowish flakes were found. The left frontal lobe was shrunken and yellowish, its ventricle dilated, the ependyma injected, and the lateral horn full of yellowish-green pus, which was found to contain diplococci; in the anterior horn there was a great proliferation of the ependymal cells, leading to a partial obliteration of the ventricular cavity. The choroid plexus was deeply injected. The brain substance was pale and anaemic, while the meninges over the occipital lobe were inflamed and haemorrhagic. The point of entrance of the bullet was marked by a piece of bone enveloped in tissue, and lying in the brain substance; the bullet itself was found in the posterior part of the brain; these two points were joined by a line about 1 cm. broad with jagged edges of greyish-white scar tissue, which, on pressure, exuded greenish-yellow pus; near the scar line was a little collection of pus about the size of a hazel nut, which had no connexion with the ventricular cavity.

56. Heliotherapy of Wounds.

AT the twenty-fifth congress of the Italian Surgical Society held this year (*Policlinico*, March 18th, 1917) ARTEMIO MAGRASSI presented a communication on heliotherapy as applied to wounds. He had seen it used in a considerable number of cases in a field hospital and in a Red Cross hospital at Brescia. The cases included large suppurating wounds of soft parts, suppurating compound comminuted fractures, and septic amputation stumps. After each sun séance a simple dry aseptic gauze dressing was applied. General treatment was always used in combination with exposure of the lesions to the sun's rays. The results are described by Magrassi as "truly marvellous," and such as could not have been obtained by the use of any antiseptic, inasmuch as in addition to rapid clearing up of the septic processes in the wounds and seats of fracture an equally rapid and remarkable improvement in the general condition of the patients was always observed.

PATHOLOGY.

57. Histology of the Brain after Gunshot.

AT a meeting of the Société de Médecine et de Chirurgie de Bordeaux on January 16th, 1917 (*Gaz. hebd. des sciences médicales*, April 8th, 1917), ANGLADE and DE TEYSSIEU showed the brain of a man who had been executed. After the firing party had done its work, the *coup de grâce* was given, the brain being traversed from side to side at the level of the upper third of the Rolandic zone by a bullet from a revolver fired point blank. Examination made immediately after death, or even, the authors say, during a remaining flicker of life, revealed traces of cellular activity continuing after apparent and legal death. Fragments of the cerebral cortex of the paracentral lobe in the immediate neighbourhood of the track of the projectile were taken and studied by Nissl's method of dealing with nerve cells and by a method devised by one of the authors for the neuroglia. The large motor pyramidal cells were found profoundly modified to a great distance from the traumatic focus. Those nearest that focus were separated in their prolongations so as to present the appearance of a jagged tree. Their cellular border was deformed and filled with a homogeneous deeply-coloured mass; no nucleus was recognizable. Further away all degrees of cell distortion and chromatolysis were seen. The most interesting feature in this part of the brain was the presence of signs of a very active process of reaction of the connective and neuroglial tissue. The nuclear perivascular infiltration was very abundant, as abundant as in the foci of meningo-encephalitis. The nuclear infiltration extended widely around the track of the wound. The neuroglia had precisely the appearance observed in the neighbourhood of foci of brain softening, cerebral abscess, etc. The astrocytes were considerably enlarged; the protoplasm was visible. The nuclei were swollen, full of nucleolar masses ready to escape and diffuse themselves in the inflammatory focus. There were all the features of a true defensive inflammation, with nothing special but the curious fact that it occurred after death medically certified.

58. Diplococcus lanceolatus as a Cause of Suppuration in Compound Fracture.

PROFESSOR TRAMBUSTI recently reported to the Medical Academy of Padua (*Morgagni*, February 24th, 1917) a case of compound comminuted fracture of the femur caused by gunshot wound in which a suppurative process which nothing could check was kept up solely by Fraenkel's *Diplococcus lanceolatus*. Restoration of bone, however, took place in a normal way. The interest of the case, according to Trambusti, consists in the localization of the diplococcus; in the fact that this was its first and sole localization; in the virulence of the infective germ, which was such that a guinea-pig inoculated with it died in twenty-four hours; in the discovery of the diplococcus in pure culture within the morbid focus; and in the regular course of the bony repair. This, according to the author, was due essentially to the slight activity of the toxins of the diplococcus.